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JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 22 MARCH, 1947 Number 2

Report of the Committee on the Training and Supply of Doctors in the Event of Another War*

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The results of a study of 68 questionnaires returned, out of a total of 79 submitted to the Deans of the Medical Schools in the United States and Canada, are presented. Dr. Berry, the original chairman of the committee which has prepared this report at the request of Dr. Zapffe, had to relinquish this position owing to his absence at Bikini during a part of the year. Since his return, he has been able to contribute to the work of the committee. The members of the committee are most appreciative of the promptness and reflection exhibited in filling out and returning these questionnaires, which were based chiefly on the paper read by Colonel Francis Fitts before this Association in 1942 under the title "Medical Education in War Time."

We summarize the opinions and conclusions presented, together with some of the pertinent comments. An attempt has been made to reduce the replies to figures. It is realized by the committee that such a method of presentation inevitably leaves significant shades of opinion unexpressed. Such over simplification appears, however, to be essential to clarity. Our effort has been to express the intent of each response. Bias on the part of the members of the committee, based on experience with the matters under discussion, could not be avoided, but an attempt to be as objective as possible has been made.

The opinions and conclusions expressed in the 64 questionnaires returned are summarized as follows:

Table 1

Should deferment be granted to	Yes	No
Selected premedical students?	55	1
All premedical students?	11	53

* Presented at the Fifty-seventh Annual Meeting of the Association of American Medical Colleges, held in Edgewater Park, Mississippi, October 28-30, 1946.

Selected premedical students but not *all* premedical students should be deferred from military service. The distribution of opinions on this subject is shown in Table 1. The selection should be on the basis of demonstrated ability and promise, and consequently could not be made until the end of the first year of college work. Premedical advisors, committees of college faculties and committees of medical-school deans and not Selective Service Boards nor representatives of the armed forces should be responsible for selecting students to pursue premedical and medical training. This is an important aspect of the exercise of authority by the schools. There is much to be gained from training a generous supply of premedical students. Those who do not succeed in entering a medical school will have had training making them very useful to the hospital corps of the military services. (Parallel programs should retain men in training in all the basic sciences.) Potential scientists are one of the country's greatest assets —they must be trained and not lost. Premedical advisors should inform the unqualified that they will not be recommended to medical schools. These advisors should also assist prospective medical students in applying to the particular medical schools for which they seem most fitted.

In war years a definite quota of premedical students should be established on a national basis. Since about 6,500 medical students are admitted annually, a quota of 15,000 premedical students in each premedical year is suggested. This represents, at the start, a ratio of 2½ available to 1 selected, and provides a reasonable margin for academic failure. This quota should be divided among the accredited colleges, approximately 90 per cent being assigned to the 70 or 80 colleges and universities which now provide the bulk of the premedical students. The assignment of quotas should be the function of the Association of American Medical Colleges and of the American Medical Association.

Table 2

Duration of premedical training recommended:

	War-Time	Peace-Time (J.A.M.A. 1946)
3 years	51	54
2 years	15	12
4 years	0	2
Total	66	68
Ratio:	3.5:1	4.5:1

In war the peacetime premedical curriculum should not be altered in content or in length. Out of 66 responses, 51 advocated at least a 3-year, and 15, a 2-year premedical curriculum. This is a ratio of approximately 3.5:1 in favor of the 3-year course. It may be compared with the existing 4.5:1 ratio noted in the Education number of the *Journal of the American Medical Association,* dated August 17, 1946. We recommend the 3-year premedical curriculum in war as in peace.

Table 3

Acceleration of	Favored	Opposed	Approx. Ratio
Premedical course	38	27	3:2
Medical course	34	31	1:1

Acceleration of the premedical course was favored by a vote of 3:2. The vote favored acceleration of the *medical* course also. The figures were 34:31, which is roughly a tie. Comments indicated that many affirmative votes indicated willingness to assist during a war emergency, rather than enthusiasm for a program of acceleration. To this generalization, there were a few enthusiastic exceptions.

It is noted that even under pressure of war, one half of the medical schools opposed acceleration; or, stated the other way, one half of the medical schools expressed willingness to accelerate to meet wartime needs. Immaturity of the students and physicians produced by wartime acceleration was a universal complaint. It was suggested that if acceleration of the premedical curriculum were avoided and the three year premedical program adhered to, the students reaching medical school would be sufficiently mature to permit acceleration of the medical curriculum. To prevent the fatigue of faculty and students which occurred during the accelerated program, all suggested plans for acceleration recommend 8 weeks per year in the form of holidays and intervals between semesters, instead of the 4 weeks granted during World War II. Experience leads us to recommend a non-accelerated program. A second choice would be acceleration on an 8 weeks' vacation plan.

Table 4

Selection of Medical Schools by	Favored	Opposed
a. Individual Medical Schools	48	8
b. Armed forces	0	45
c. Combined a and b	28	21

A vote of 48:8 emphasized that medical students should be selected by individual medical schools. No one voted in *favor* of selection by the armed forces, whereas 45 voted *against* this method of selection. As a second choice, selection by combined representatives of medical schools and the armed forces would be agreeable to more than one half of the schools replying. The vote on this question was 28:21.

Table 5

Preference for methods of selection

Navy method	26
Army method	0
Equally satisfactory	3
Neither satisfactory	6

The Navy's method of selection of medical students during the last war,

which involved giving professional, academic groups considerable authority in the selection of students and permitting the students so selected a choice of medical schools, was much preferred by the medical schools to the more arbitrary Army method. Thus, whereas 26 favored the Navy's method, none preferred the method utilized by the Army. Thus, also, one reply contains the statement, "Our Navy trainees did better on the average and among them were found more outstanding students than in the case of the Army." It is our opinion that the individual medical schools, by virtue of their long years of experience, should in war, as in peace, be given the responsibility for the selection of candidates for the study of medicine.

Table 6

Should medical students be	Yes	No
a. Deferred	64	1
b. Put into uniform	36	31
c. Fully subsidized by the government	30	37

Practically all who replied felt that medical students should be deferred from military service throughout the medical course. The vote was 6:5 in favor of putting them into uniform. Several deans suggested the granting of special insignia, instead. The advocacy of placing students in uniform was based to a considerable degree on the attitude of some medical students who felt that they were shirkers, or that their friends so considered them. In a reply from Canada it was predicted that another war would certainly require universal regimentation of society and that under these circumstances no stigma would be attached to a civilian medical student or faculty member. Many expressed the view that the A.S.T.P. and the V-12 programs were "superfluous."

Table 7

Method of Provision of Books and Equipment:	
a. Government issue	17
b. Private purchase	39
c. Governmental vouchers	3
d. No opinion	9

Subsidization by the government of all expenses and equipment was opposed by approximately a 6:4 vote. The preferred alternative was that "Loan funds, rather than subsidy, should be available for needy medical students." Government issue to medical students of textbooks, instruments and other supplies was favored by 17 and *opposed* by 39. We quote this comment: "If the Army gives young men full maintenance and the salary of a private first class, they should be required to purchase their own books and supplies." An aspect of the question which it is important not to overlook was stated as follows: "Some form of governmental subsidy is important, for we learned during the war how many capable students had failed because of economic handicaps to reach medical school in the past. We cannot afford such wastage in wartime; we ought not

to put up with it in peacetime." Issuance of a governmental allotment or voucher of $75.00 to $100.00 per year to each student, or at least to each needy student, for the purchase of books and equipment was recommended by 3 deans. This would permit flexibility in purchases by the students; it would give them individual responsibility; it would eliminate a considerable amount of bookkeeping and of overworking of understaffed personnel in the medical school.

Rather universal sentiments concerning A.S.T.P. and V-12 allotments were thus expressed: "The policy of total and complete government support for students in any profession helps them to achieve an irrational outlook on their social responsibilities." "It is not good for young people to get the notion that the country owes them everything." "This policy has made a number of them demanding leeches."

Two suggestions were submitted to replace what one dean labeled "Such monstrous foolishness as A.S.T.P. and V-12":

1. "Defer faculty and students and leave all other matters to individual schools and to the Association of American Medical Colleges" and

2. "Enroll fit students in the Enlisted Reserve Corps and then place them on inactive duty status—Students failing to do satisfactory work could be activated and sent to duty. Thus, the Army would have direct hold upon these men and there would be absolutely no need for all the fuss and furor, the rigmarole and red tape, and the wasteful and vicious practice of army programs; the need for financing books, housing, uniforms, medical care, tuition and other items of expense which any young man in such a situation could and would reasonably expect to bear. In this way, the Army would have its doctors; the schools would have 'Civilian' students. Because they are already in the Army or Navy, none could say the students were draft dodgers." Both of these plans appear preferable to the A.S.T.P. and V-12 programs. We are inclined to recommend the second of the two if combined with a policy of governmental loan funds and allotment of books for the needy, plus a special enlisted reserve corps insignia.

Table 8

Opportunity for Student "Repeats"

Favored	22
Opposed	37

The vote was approximately 5:3 against allowing students to repeat a year or a course during wartime, but it was nearly 3:1 in favor of leaving the decision as to repeats up to the faculties of medical schools. Since no opportunity is provided for summer studying before repeating an examination, conditions and makeup examinations are not compatible with an accelerated program. A weakness of the wartime program has been a tendency for kindhearted committees to promote some students who did not deserve promotion. It would seem wisest to leave the decision in this matter to the individual schools, with the recommendation that repeating should be permitted only in exceptional circumstances.

Table 9

Dormitories and Common Mess

Opposed	48
Favored	8
Status quo	6

The need for considering local situations rather than operating under blanket, nation-wide regulations was evidenced by the answers to several questions:

a. Housing students in dormitories and feeding them in a common mess was considered inadvisable by a large majority, primarily because of the dangers of regimentation, but it was realized that local situations might occasionally require such housing and messing.

b. Medical and dental service for medical students, in the opinion of 49 commentators, can best be handled by the established University Student Health Service, but, obviously, where such a service is not available, some substitute plan must be arranged. It was not considered desirable to have this service rendered by Army officers or at Army installations.

Table 10

Government Contracts

Approved	39
Approved with reservation	10
Disapproved	7

c. The handling of contractual matters with the Government, pertaining to A.S.T.P. and V-12 programs, was considered generally satisfactory by approximately a 7:1 vote, but criticism of the cumbersomeness of the methods and the delays in payment was voiced by 10 of those expressing general approval. The desirability of giving individual medical schools more voice in local management was thus expressed: "The government should grant more autonomy to the medical schools. It is doubtful that there would be any significant degree of extravagance." We concur in this recommendation. Elimination of the A.S.T.P. and V-12 programs would happily eliminate this entire problem.

Table 11

R.O.T.C.

Opposed	37
Favored	18
No knowledge	13

R.O.T.C. Training Programs have been reinstated by the Army in medical schools in which such programs were in existence before the war. As conducted before World War II, these R.O.T.C. courses were considered by a vote of 2:1 of those replying to have been of doubtful or of no value. Several deans strongly advocate continuance of the program, but more believe that the R.O.T.C. program was futile as given and that it tended to interfere with studies. It is

thought that the same ground might be more effectively covered during a summer encampment or after a doctor has been inducted into service. Moreover, it was considered unjust that those who spent time and effort in taking the course before World War II received during the war no preferment on this account. We quote one opinion, parenthetically, "R.O.T.C. Training in medical schools in peacetime has something to commend it. It furnished the student with a few weeks' paid vacation in the summertime and a uniform, the pants of which are quite good for skiing." It remains to be demonstrated whether the newly initiated program will be sufficiently improved to justify its retention.

Two critical comments are quoted in toto: "Predicated on the training program which existed before World War II, we would not be in favor of a like R.O.T.C. as being of any value. If the military authorities in their plan for national defense consider some medical military instruction desirable, we are of opinion that this can best be done by assigning to the medical school a well qualified, alert junior medical officer, for not less than one year, nor more than two years. This officer would be selected because of his ability to profit by graduate study and to be required to follow a postgraduate research course throughout the year under the Head of the Department in which he has a major interest. This officer to give not less than 6, or more than 10 seminars in the field of military medicine or subjects which military authorities desire. This would assure the medical school of getting the highest and most intelligent type of professional men in their school as representatives of the military forces. It would also definitely be beneficial to the professional training of the military services. This contact would be more stimulating and the accessions to the military medical services would be on a sounder basis."

"I am completely opposed to the reintroduction of R.O.T.C. programs in medical schools and I believe that my experience in the Army and as a former R.O.T.C. student gives me a background for forming an opinion. I was a member of the R.O.T.C. for four years as a medical student and also attended the six week course at Carlisle Barracks at that time. I believe it was time wasted and would have been even if a war had come shortly after I had finished that period of training. This is largely because all of us in the course took it without any particular thought of using what we learned. During the recent war, on the other hand, medical officers obtained infinitely more in a short time through intensive courses given at Carlisle Barracks and other places. Furthermore, men who had reserve officers' commissions were at a disadvantage in the recent war if they were young, and there were repeated instances of officers going in directly from civilian life with a higher rank in the Army than their contemporaries in the medical reserve. The reserve officers in the older age group presented problems of another sort which I repeatedly encountered as Medical Consultant. The sort of man who stayed in the Reserve usually had a somewhat "boy scout" attitude and was rarely a highly skilled physician or surgeon. On the other hand, his years of service assured him a rank of Lieutenant Colonel or Colonel. There just were not suitable Army positions to give these men with high rank but who lacked the skill to head professional services.

In other words, I believe that the plan to introduce the R.O.T.C. is worse than waste of Government money, for it would be money spent to the detriment of Army efficiency."

Table 12

Military Instruction in the Medical Curriculum

None	14
Minimal	5
1 hr.	15
2 hrs.	13
3 hrs.	5
4 hrs.	4
5-6 hrs.	1
Camp	6

There was considerable variation in opinion concerning the amount of military instruction during wartime which is considered to be compatible with effective work in the medical course. Of 63 replying, 28 recommended 1-2 hours per week and 14, no instruction at all. The 10 remaining recommendations scattered over a range of from 3 to 6 hours per week. We quote two comments. The first: "We struggle from the time students enter until the time they leave to make individual thinking and acting persons of them. Military instructions at the levels given to medical students during World War II was a flat negation of this fundamental concept." The second by a former medical officer: "It is recommended that acceleration not be practiced and that the entire summer session be devoted to field medical exercises that are realistically and intelligently applicable to the contemplated duties of the Lieutenant of the Medical Corps. Military Surgery is normally adequately treated in proper courses of traumatic surgery, orthopedic surgery and public health instruction that are well presented in the average medical course in war just as in peacetime." In our opinion the value of special instruction in military medicine in medical school in time either of peace or war has not as yet been demonstrated.

Moving now from student to faculty problems, we quote the following comment: "The great reduction in staff in many departments, particularly in medicine and surgery, may be one of the inevitables of war, but if standards are to be maintained during a national emergency, provision should be made to retain adequate teaching staffs." Although no one wished to interfere with the right of faculty members to volunteer for military service, the necessity for better means of retention of adequate teaching staffs was underlined. How is this to be accomplished?

Table 13

Teaching Staff

	Deferment	Assignment
Favored	63	22
Opposed	4	35

Of the 64 replies, 62 favored deferment of the teaching staff from military service; 22 favored and 35 opposed, the detailing of medical-officer faculty members to medical schools. A strongly worded reply to the question of detailing medical-officer faculty members read: "No—most emphatic No! A large number of the younger Faculty and some of the Senior Faculty will always have to be released to the Army in case of war. The medical schools cannot be relieved of this responsibility and schools will have to get along with greatly reduced faculties. Those members who do remain should be deferred because they are doing essential work. I would not want "Bars" and "Oak Leaves" running around on this faculty during a war." There was repeated expression of fear that commissioning of medical faculties "would place the medical colleges completely under military control." Several, on the other hand, felt that commissioning some or all of the faculty would be a good solution providing the schools were permitted to select and to retain these men. Several others voiced an opinion like the following: "Rotation of members of a medical faculty between service in military institutions and at his own medical school would maintain a more adequate teaching staff, would keep the medical officers from going stale and would bring to the students first hand accounts of military problems." A specific means for accomplishing this was outlined in one reply as follows:

"In the event of another national emergency it is believed there should be a sufficient backlog of trained medical officer personnel. These needs can be met only if each physically qualified young graduate is required to give a certain amount of service to his country. A program of summer training camps along realistic and informational lines could well meet the needs.

"During the emergency a Selective Service System should be operated, but a National Service Registration should precede the operating of Selective Service. A civilian agency with representatives of all segments of medical practice should be entrusted with the assignment and recall of all doctors in the country.

"Medical schools should be allowed to operate along lines as close as is possible to their normal peacetime operations. Faculties of medical schools would be assigned to duty with a medical school by the National Governing Board. Medical students would likewise be assigned to medical schools by this Board. Medical officers would be selected by the Board from among the available physically qualified, emotionally stable and professionally trained individuals. A definite system of rotation should be announced and strictly adhered to throughout the emergency. The civilian agency should release doctors to the Army and Navy for limited periods of service and upon completion of the term of service, they should be available for reassignment at the discretion of the Board."

This proposal appears to be workable, provided that the National Governing Board is so constituted that the medical schools are given power in the selection and retention of their own faculties and student bodies.

Concerning intern training, only 2 recommended 9 months of internship, 48 recommended 12 months, or a minimum of 12 months, 3 recommended 18 months and 4, 2 years.

Prewar methods of selection and training of residents were recommended during wartime. In wartime the training of specialties must not be interrupted. We quote several comments:

(1) One dean suggested formation of a "Board to fix (a) military (b) civilian requirements. Candidates to meet these needs to be selected (1) from recent graduates in armed forces, 1 or more years in actual combat from finer prospects in armed forces, (2) from men disabled for active duty, and (3) women. The plan of World War II insured deficiencies for all purposes."

(2) "From one-third to one-half of the interns should be retained for a second year of training and from one-third to one-half of the latter group for a third year. Perhaps some should be kept longer than this. It is essential that some young men be given enough postgraduate training to provide a continuing flow of top flight individuals for the future. Selection should be left up to the schools and hospitals."

(3) Again, "If the war had lasted another year the Army would have been desperately handicapped because of the inadequate hospital training of their younger medical officers. The resident system through the past 20 years was responsible for the brilliant work of the medical corps. The Army should permit the maximum number of men who can be spared to remain in the inactive reserve in order to continue training until they are actually needed, instead of collecting them into larger pools long before they are ready to use them." "The Army should not consider medical manpower in the same category as tanks and canned tomatoes."

Many of the answers given suggest the need for a change in tables of organization of the armed forces. We quote one reply: "Most of the faults and complaints of our recent program would appear to be the result of the secondary or inferior position which the Surgeon General of the Army's office occupies with respect to the Supreme Command." This situation is better in the Navy. "The medical profession should have a recognized place in high authority. Correlated with that, there should be encouragement for the best medical minds to participate early in the formulation of medical programs—Britain, with perhaps more tradition, was less wasteful of professional personnel. In addition to preserving the non-accelerated program, no barrier separated professionals in civilian and military service."

Since medical care in time of war involves induction of many civilian physicians, and since the nature of the destructive implements being developed is such that, in the event of another war, civilian health and civilian injuries may be as important a military problem as the health and injuries of the armed forces themselves, the committee wishes to submit these suggestions offered in the replies to the questionnaires: (1) that the armed forces should consider alteration of the tables of organization in the armed forces so that only skeletal medical units will be retained, (2) that physically fit graduates should be placed in the enlisted Reserve Corps in time of war and should be permitted to continue their hospital residencies and specialty training, and should be called to active duty *only* when

they are actually needed in the theater of war, (3) that battalion aid stations should be manned by enlisted men well trained in first-aid, rather than by doctors, (4) that an administrative corps not composed of physicians should be developed to handle the paper work, and (5) that increase in rank for doctors in the armed forces should be so arranged that physicians of higher rank may still be permitted to be doctors.

A final quotation is presented by way of summary:

"We believe that the armed forces must learn how to make better use of medical manpower—all of our staff members back from service emphasize the waste of medical-officer personnel. There are many ways of extending a physician's hands, provided the physician is good in the first place. Our Allies did this successfully, while we continued to adhere to the 'Sacred Formula' of 6½ doctors per thousand. In the event of another war, we must do all we can to avoid the evils of shortening the premedical and medical periods of training, accelerating beyond the point of successful academic accomplishment, teaching with inadequate staffs, and cutting down on essential postgraduate training in hospitals. Now is the time to plan—not after the outbreak of war forces hastily-conceived, trial-and-error methods. No matter how war may change in the future, sound educational practices will pay dividends.

"Many of the losses in the quality of medical training during the past war would have been avoided had greater autonomy been granted to our universities and professional schools. We know how well the exercise of such authority worked in England and Canada. Under such circumstances, planning and execution would be in the hands of those thoroughly acquainted with the teaching problems involved, rather than in the hands of the military."

"Our firm conviction is that the Army should handle Army work and allow educators to handle education. We had a beautiful demonstration of people trying to do something with which they had no familiarity and making a mess of it. It will take years for us to wear down the unfortunate things that have cropped into premedical and medical education under the program of the last three or four years."

The fundamental issue in the entire problem of medical education and supply of physicians in time of war is that the job of doctors in military service is to function as doctors and only incidentally as soldiers. Doctors will consequently be best trained to do their job at the war fronts when their training as doctors is the best available. This was demonstrated by the successful job done by well trained civilian doctors when called into service in World War II. If this job is to be repeated, it is imperative that the process of education of doctors shall not be unnecessarily obstructed by the needs of military organization.

We conclude with this comment:

The deans who answered the questionnaire and the members of the committee preparing the present reports are fully aware that it is always easy to criticize. There is only one way to avoid the evils attendant on programs thrown together

under the pressure of war. *Now,* before some future "Pearl Harbor" is the time to formulate the way in which the medical schools can best plan their programs to meet possible wartime needs. This report is obviously only a first step in the formulation of a program. It will take a painstaking study to find the best solution for the many problems about which such a divergence of opinion exists as is noted above. In recognition of this fact, we should like to offer the following resolution:

"Whereas representatives of the Army, the Navy, the Veterans Physicians, the American Medical Association and the Association of American Medical Colleges have all been surveying their experiences in World War II, and

"Whereas the problem of medical education in wartime is inextricably interwoven with the problems of civilian and military medical care and the Tables of Organization of the armed forces.

"Be It Resolved, that the Association of American Medical Colleges invite each of the above named interested groups to select representatives to form a liaison committee which will study and report on the problem of medical education and medical care in wartime and will attempt the formulation of a plan for use in case of a future war emergency."

Private Clinics in Medical Schools*

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This is for medical schools a period of critical self examination and planning for the future. Curricula, research programs and plans for new buildings are under special scrutiny. Unless I am mistaken, a subject of overriding interest in many institutions is the care of patients as a joint function of medical school and affiliated hospital. There are several reasons for this. It is generally recognized that medical service has lagged behind the progress of medical science. There is a widespread belief that changes in economic and social factors affecting medical care are imminent. There is, moreover, a reasonable fear that sweeping changes may be instituted or imposed which have been planned inadequately or tested insufficiently. These and other considerations have impelled the responsible officers of medical schools and hospitals to give special thought to the feasibility of assuming larger responsibilities in the field of medical service.

Among the other considerations I should like to mention first and to dispose of one of the most obvious. In the continuing search for funds to support medical education, there looms the possibility of increasing income to medical schools and hospitals by rendering medical service to patients able to pay for it. This is undeniably possible, but I suggest that the rapidity with which important additions to medical school income could be made by this means may be overrated, and that the difficulty and the cost, in these times, of developing large scale facilities and organizational arrangements for this purpose may be underestimated.

I prefer to emphasize the opportunity which is before medical schools and hospitals for the study and trial of methods of medical service as a joint function. There is a long tradition of such service on behalf of persons of various degrees of indigence, in which members of clinical faculties have willingly pooled their experience and efforts in the study and treatment of disease. An early, if not the original, pattern of this joint activity of medical faculties and hospitals was set by the city or "poly"-clinic in nineteenth century Europe. The physical plant and facilities were furnished by the city to provide free care for the indigent sick. The medical school undertook to supply professional services by its clinical faculty in return for the privilege of using some of the patients for study and teaching. This, or a similar arrangement, is now an integral part of every medical school in this country. Of the 2,472 hospitals of over 100 bed capacity, 300, or about one in every eight, is closely affiliated with a medical school. Such an affiliation is undoubtedly welcome to hospital authorities because of the high quality of medical care which it assures. It is worth particular emphasis, I believe, that, at least in the case of some municipal or state institutions, the arrangement is sought in order to remove matters of medical care from political influence.

* Read before the Fifty-seventh Meeting of the Association of American Medical Colleges, held in Edgewater Park, Mississippi, October 28-30, 1946.

In these "University, or Medical School, Clinics," the schools and affiliated hospitals join to furnish diagnostic, therapeutic and, to an increasing extent, preventive medical services. The facilities,—wards and outpatient departments,—are operated at a considerable deficit which is made up from taxes, surplus income from "private" rooms, endowment, or philanthropy. These enterprises have as their fundamental purposes the instruction of undergraduate medical students and the training of house officers. They are permeated and dominated by the spirit of scientific inquiry implicit in the university atmosphere.

The advantages to patients who apply to such clinics for care are important and obvious. The best of diagnostic laboratories and specially trained nonprofessional personnel are close at hand and economically organized. The patient receives the professional services of a carefully selected group of physicians, surgeons and specialists engaged in teaching and the study of disease, who are promptly informed of advances in methods of diagnosis or treatment. The members of the professional staff perform their "clinic" duties on the same premises, and their findings and opinions, together with all other data regarding the patient, are usually preserved in a single record. All this is available to the patient at a cost within his means.

To be sure these arrangements are not without their outstanding defects, many of which stem from inadequate financial support. The outpatient departments in nearly all teaching hospitals are overcrowded and understaffed. Both medical service and teaching suffer from the fact that many staff members can afford to give time to outpatient duties only because they earn their living caring for other "private" patients. Being a responsibility of the institution, the patient sometimes lacks the guiding interest of an individual physician and becomes obscured as a person by the details of his disease. Finally, overorganization leads sometimes to compartmentalization and a tendency to refer the patient to another department or subclinic rather than to confer over him and his problem with a knowledgeable colleague.

Nevertheless, the resultant medical care is of a very high quality. Moreover, many of the important advances in scientific medicine have emerged from just such "University clinics."

Originally intended to afford free care to the indigent sick, these joint hospital-medical school activities have already undergone extension in some directions. In municipal or state hospitals, citizens are usually eligible for care without charge. When the arrangement involves a "voluntary" hospital, the patient is charged what he can pay, which may be nothing, or the full cost of laboratory or ancillary services but not a professional fee. Indeed, the definition of "indigent," and by implication eligibility to this type of medical care, has come to be determined by the ability of the patient to pay for the professional services rendered.

Not all patients of the "ward" or "dispensary" class become continuing charges of the institution. A moderate and increasing proportion are referred by their own physicians for study, and are returned to them with reports and sug-

gestions. Such persons cannot afford the full cost of exhaustive studies, including consultation fees; but, the nature of their illnesses having been determined, they can, presumably, receive treatment at a cost within their means from their general practitioners. In this type of arrangement one discerns an extension of the joint medical and educational activities of school and hospital to provide consultant advice. The patients are served by rendering assistance to their physicians. If the reports are written with proper care, the physicians are helped on behalf of these and other similar patients by the information supplied.

It is along this line that various institutions have undertaken a limited extension of their services to include patients able to pay a modest professional fee. An example of such a "diagnostic clinic" is distinguished by several features. The patient is usually charged an inclusive fee. The professional staff is paid by the session and not at the rate of so much per patient. Finally, the service is not usually available to patients who apply directly but only to those who are referred by a physician. Results of diagnostic study are reported directly to the physician; they are not usually discussed with the patient. No therapy is undertaken except on the explicit request of the physician. This is a circumscribed diagnostic service rendered to the patient's doctor on behalf of the patient. The study is planned and consultant opinion rendered by members of the clinical faculty, but the service is otherwise very similar to that of a laboratory which conducts certain tests on request of a physician and sends him the results.

At about this point it is customary to discriminate the "private" patient. The inpatient in "semiprivate" or "private" accommodations in an affiliated hospital receives many of the advantages of the "ward" patient. He frequently has the services of the same laboratories and ancillary facilities as the patients in the wards. Consultant opinion is promptly available from members of the clinical faculty who regularly visit the hospital in connection with their university duties. It is fair to say that there is some luxury at both ends of the scale,—the private patient receiving additional comforts as well as privacy; the ward patient getting somewhat more directly the results of the continuing spirit of inquiry which permeates medical teaching and research.

It is the ambulatory "private" patient in particular to whom the advantages of the joint activities of hospital and medical school do not customarily extend. If such a patient applies directly to the hospital for examination, he is usually referred to a member of the clinical faculty. This does confer the special advantage that he becomes the particular responsibility of a single, well qualified physician. At the same time, it may not invariably assure the most expeditious and economical conduct of a complete diagnostic study. Except in the few instances in which a large and representative number of staff members practice as a group, within the hospital premises or without, the patient must often go to several offices to complete his examination. The additional cost is not measurable, but is indicated by the fact that the overhead cost of operation of group clinics which I have visited is from 15 to 20 per cent, while the reported average office overhead of an internist is from 25 to 35 per cent.

Physicians are always willing to reduce their fee to an amount within a

patient's ability to pay, but patients are often too sensitive to ask for reductions from several physicians individually. Consequently, in an important number of instances the patient may avoid seeking early advice, or, knowing the limits of the patient's purse, his physician may try to do without the benefit of some additional studies.

Enough has been said to indicate that the possibility should be explored of extending some or all of the benefits of the joint medical functions of schools and hospitals to the service of patients able to pay the cost of diagnosis and treatment including a professional fee. How may this be done?

The first step in any case must be the augmentation of space and facilities for the care of ambulatory "private" patients in the hospital premises. This confers on them at least the same advantages as those enjoyed by "private" inpatients. It tends, as well, to centralize, somewhat, the professional activities of the clinical faculty.

Another step might be patterned after a feature of the "semiprivate" service for inpatients which has been established in some institutions, including the Johns Hopkins Hospital. The important details are an inclusive fee covering all laboratory services, and a predictable maximum for professional charges.

To test fully the possible advantages of extending the joint medical functions of school and affiliated hospital to private patients, provision must be made that the care of such patients be assumed by the institution, the professional staff attending the patient on behalf of the "clinic." Laboratory assistance or consultant advice must be made accessible without regard to cost.

Certain special reasons have, I believe, deterred such experiments. The first is the present inability of anyone to lay out an entire plan which can be engrafted promptly on existing arrangements. There are many features on which no one can be fully informed in advance. On the other hand, this is, perhaps, a special reason for making the experiment, though on a modest scale.

The second is the short supply of hospital beds. Recognizing that, among private patients attended in such a clinic, a significant number would require hospitalization, responsible officers are understandably reluctant to overload an already heavily burdened hospital service. Others, far better qualified, are attacking this problem but I venture the suggestion that, pending the possibility of new building, or even thereafter, some better division of available beds might be made according to whether they are to be used for diagnostic study with rapid turnover of patients, for medical or surgical treatment of the acutely ill, or for convalescent care.

More significant is the opposition to the establishment of a private clinic in the medical school which is voiced by members of the clinical faculty. These physicians, surgeons and specialists earn their living in private practice and serve the medical school and hospital in teaching and in the care of the indigent, largely without pay. It is contended that it is unfair or unwise that the medical school and its affiliated hospital should sponsor an enterprise in direct competition with a majority of its clinical faculty. Certainly, one can sympathize with this point of view but it need not prevent making the experiment.

If this is to be done, it should be started on a small scale. In institutions in which services are now rendered to ambulatory "private" patients by the salaried staffs of various departments, these services should be augmented and facilitated. Local factors will determine local arrangements but certain general principles may be suggested. The organization should be built about strong departments of medicine and surgery. The "clinic" staff should potentially represent as wide a variety of competent specialists as possible. Arrangements should be available for prompt, face to face consultation with specialists without waiting to refer the patient or to make another separate appointment. Each patient should be the personal responsibility of a single staff member. From the outset, advantage may be taken of the opportunity for postgraduate teaching by the appointment of clinical assistants or apprentices.

It should be the continuing purpose of such an enterprise to study the means of improving medical service. Large clinic load is not a desirable objective. The school and hospital should not become appendages to an immense ambulatory clinic. As experience accumulates it may become possible to develop a scale of inclusive fees. Finally, in some instances, it may prove feasible to embark on a limited adventure in prepaid comprehensive medical care.

Organizational features, or methods of practice, which appear desirable in a "private" clinic should not be withheld from the outpatient department for indigents. Every attempt should be made to develop as a joint activity of medical school and hospital a homogeneous, efficient organization to provide medical service expeditiously and economically to patients of all strata of income.

I referred in the beginning to the current concern regarding medical care. The rewards to institutions which may undertake such extensions of their services as have been suggested, or others better conceived, cannot be forecast. All the complexities cannot be foreseen. But it is surely a particular function of medical schools to add to the sum of medical knowledge; and in the planning, and the testing of plans, for the improvement of medical service in this country the joint activities of schools and their affiliated hospitals can play an important and thoughtful part.

Recent Advances in Medicine and Their Effect on Premedical Needs*

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World War II and the rapid advances in available specific information, through application of the principles of chemistry, physics, electronics and genetics have left an indelible impress on the field of medicine. Changes have come so rapidly in the past decade that recent graduates from our schools of medicine, as well as men who have been in the field of practice for much longer periods of time, are considerably out of date if one compares the medical information they received during their periods of training with the newer knowledge in the field. This is amply substantiated by data available on the number of graduates of the 1935-1943 period, who, after discharge from the armed services, are endeavoring to return to school to do postgraduate medical educational work, to take residencies in the various specialties, or simply to do intensive refresher work for longer or shorter periods of time in the basic sciences and clinical fields. Further substantiation comes from the decision of the American Specialty Boards to cooperate in offering a Part I Examination in Basic Sciences to be taken by all candidates regardless of the specialty.

Going back about fifteen years in the field of medical developments, let us consider changes which have occurred since the introduction of the vitamins as known chemical constituents with known functions in the human body. During the 1920 decade considerable academic interest but little scientific knowledge was available on which to base accurate diagnoses of avitaminoses or the use of vitamins in the treatment of patients. Today, not only is the chemical composition of the more important vitamins known, but they have been synthesized, and their specific functions in the various body economies are well known in many cases. This knowledge suggests ever widening applications.

In the late 1930's the sulpha drugs were introduced into the practice of medicine. All will recall the miracle working properties which were attributed to the first of the sulpha drugs available. From the standpoint of saving lives from the effects of diseases previously hardly touched by other methods of treatment, the sulpha drugs did add something in the nature of a minor miracle to our therapeutic armamentarium. Furthermore, in the few years since their introduction, chemotherapy has had great extension in many hitherto unrecognized directions. True, mercury and arsenical preparations, quinine and a host of antiseptics were in general use. Now, chemotherapeutic agents are becoming available in many additional and diversified forms for the treatment of many ailments previously not considered to be suited to such an approach.

* Read at the Fifty-seventh Annual Meeting of the Association of American Medical Colleges, held in Edgewater Park, Mississippi, October 28-30, 1946.

In the first world war, the Committee for the Study of Shock made a tremendous effort to obtain information on the restoration of blood volume. Various solutions, ranging from hypertonic sodium chloride solution, through those containing isinglass, gelatin and 6 per cent gum acacia were proposed at various times for use in intravenous medication for the restoration of blood volume. It may be recalled how unsatisfactory all these proposals turned out to be. But starting at about the same time, there was developing, particularly through the influence of Jacques Loeb, a small group of scientists whose primary interest was in the protein molecule and its peculiar chemical and physical properties. No longer was the interest directed toward the amino acid content of protein. Lines were drawn between the scientists who considered the protein aggregate in solution as a molecule and those who considered the protein to be only a specialized colloid obeying the rules and regulations for such particles, as set forth by Graham. No one could foresee that, when the next world war came, this earnest group of investigators would have solved, in a large measure, the problems of maintenance of blood volume and the treatment of shock. Plasma protein, probably above everything else, other than the outstanding skills of our well trained physicians, contributed the very most to the saving of the lives of our young men during the past war.

Penicillin and the numerous antibiotics that have followed within recent months have added to the complexity of the picture. It is impossible to foresee where the accumulating mass of research in this very new field will lead us with respect to the treatment of human ailments. Truly, something not necessarily new, but with far greater emphasis, has been added to medicine as a result of these developments in chemotherapeutics. To go further, one should mention the synthesis of atabrin and other quinine substitutes used as antimalarials; efforts which are proceeding apace toward the synthetic production of antibiotics; the expanding and exceedingly important emphasis which is being placed on the chemistry of the cell nucleus and on nucleoproteins as these fields pertain to the solution of the cancer problem, and the work with the gene, its relationship to transmission and causation in disturbances associated with the Rh factor.

Advances in chemistry are not limited to the field of organic chemistry. Witness the use of radioactive potassium intravenously in efforts to treat leukemia; the isotopes, radioactive and otherwise, including the use of tracer elements, to obtain information pertaining to intermediary metabolism; all of these matters which must be dealt with, not only by the medical students, but also by the practicing physician who unfortunately for his peace of mind finds articles pertaining to these subjects in his medical journals.

In the field of physics as related to physical medicine and physiological chemistry, great advancements have been made. X-ray diagnosis and treatment have advanced with great strides as a result of the development of more powerful and more accurately controlled equipment, material contributions which have been brought to the field of medicine by our associated scientific friends, the physicists. Langmuir, Danielli, and others have been working with considerable

success over a period of years on questions pertaining to membrane phenomena, permeability, and their relationship to the passage of fluid, protein and salt from one compartment of the body to another. The applications of these new tools are rapidly being made and are adding to our knowledge of water balance, edema formation and control. Recently, Darrow and his associates have added greatly to the ability of the pediatrician to control water balance in dehydration resulting from pernicious vomiting and diarrheas, particularly in children. This has come about as a result of the emphasis placed on the potassium ion as a retainer of water in the intracellular compartment. Very recently, Erwin Schroedinger in his book "What Is Life?" has attempted to make an application of physical laws as based on statistical averages to life problems and relationships.

Especial emphasis should, I believe, be placed on the use of isotopes and tracer elements and the information their use has brought to the field of medicine. There are the experiments by Dr. Conant of Harvard, and his collaborators, on the use of radioactive carbon as a tracer element in obtaining new information with respect to carbohydrate metabolism. Radioactive carbon, in the form of sodium bicarbonate, was given by mouth at the same time that glucose, containing the usual kind of carbon, was given intravenously. Shortly thereafter, in fact in a period of minutes, the experimental animals were killed, the livers removed and it was discovered that the glycogen laid down in the liver was composed, in part, of glucose containing radioactive carbon as a unit in the six-carbon-chain. This simple observation was more profound than it appeared on the surface. Here was evidence that the whole structural make-up of the fundamental units of the body are in dynamic equilibrium, as Rudolf Schoenheimer emphasized. In order to understand fully the implications of what we commonly call normal structure we must realize that rapidly and constantly there is change rather than stability and that the net result, which we call "Health," is truly a matter of "homeostasis," as Dr. Cannon of Harvard termed it.

Thus we come to the necessity of placing greater emphasis on an old theme. If health is to be construed as normal equilibrium, with proper function in all organs doing their job in a proper manner, then disease must be considered as a departure from dynamic equilibrium. The need, therefore, is for the physician to serve as a health engineer and analysist whose function is to readjust the equilibria of the body and bring them back into normal homeostatic balance.

Thus the issue raised by the new, rapid and somewhat startling advances in the field of medicine is squarely joined. We must examine carefully our reasons for existence as medical educators. It is no longer sufficient (nor has it ever been, for that matter) merely to train "rule of thumb" practitioners, to be sent out to practice medicine literally on the public following graduation from medical school. We must make a distinction in our minds with respect to our purpose in training young men to be doctors. We must distinguish between the doctor as one who merely treats disease through diagnosis, prognosis and treatment, and the doctor as a health engineer who promotes, on the basis of judgment and functional application of knowledge to the accomplishment of his purpose, the

readjustment of the dynamic equilibrium of the body. The "Why" is becoming as important as the "How."

The new constitution of the Association of American Medical Colleges which is in preparation for discussion wisely places emphasis on the prevention of disease and the promotion of health as one of the major functions of the physician, along with the older concept of the physician as a diagnostician and an expert in treatment. This is certainly in line with the new developments in medicine.

If we accept the thesis that it is our duty to train better practitioners in the field of medicine with greater appreciation and fuller understanding of the recent advances in medicine as based on recent scientific advances in many fields, then we must look very carefully at our premedical and medical educational programs, to see whether changes might be made to better our approach in both categories. It is obvious that the medical student of the future must know more of organic chemistry and its application, be more conversant with physics and the application of the principles of physics to the various fields of medicine, and be better qualified as an educated man to apply all knowledge to studies in his chosen field of medicine.

The question immediately arises as to whether the subjects which we now consider to be required of premedical students are sufficient. If one glances at the catalogs of the various medical schools, one realizes immediately that there is no uniformity of opinion to serve as a guide. Required premedical work varies from a few courses in chemistry, physics and biology to required curricula in foreign languages, history, mathematics, government, sociology, psychology and several other special subjects. In point of quantitative amount of training, it is possible for premedical students to enter some medical colleges after two years of premedical training, whereas in others the baccalaureate degree is required before admission will be granted.

Do any of these required curricula *per sé* guarantee that if satisfactory work is done during the pursuance of the curriculum the student will be prepared for the study of medicine? I think not. Let us endeavor, therefore, to analyze, in so far as we can, possible procedures which may be available to us to meet the challenge raised by the new knowledge of medicine. We might all agree that the first step would be to raise the total amount of premedical education required for admission to medical schools to the level of the baccalaureate degree; no student would be admitted to any medical school until he had received the baccalaureate degree or its equivalent in work. The experience that all of us have had with the evaluation of premedical students would indicate immediately that this cannot answer the challenge, except in part. Students who have had the greater opportunity for college work usually come to us better prepared for the study of medicine, but there are always the exceptions which, unfortunately, leave us in a quandary. Most of you will agree that although this may be a step in the right direction, it is not the total answer to our problem.

Secondly, we might consider as advisable the requirement of more scientific

courses in the premedical curriculum, regardless of length, since most of the foregoing summary of recent developments has dealt with advances in medicine coming through greater application of basic sciences. Some medical schools already require four chemistry courses, two physics courses, and at least two biology courses in the premedical curriculum. This is a heavy dose of specialized training at the premedical level. It is certainly true that the students coming to medical school after having taken this large group of science courses would be more capable of handling the scientific material presented in the medical school courses, but would they eventually be better physicians with a greater ability for judgment and analysis? Is it not true that the humanities also have their place in the education of a well rounded man (and let us hope that our graduate physicians may be so designated)? It would be unfortunate if in attempting to develop a more scientific type of medical practitioner we failed utterly to consider the physician as a human being.

Thirdly, we might consider increasing the medical curriculum to five academic years. This would give us an opportunity to spread some of the subject matter now contained in the medical curriculum over a longer period of time and at the same time introduce into the first and second years of the medical curriculum a correlation between the premedical sciences of chemistry, physics, biology and genetics, and the scientific background for the field of medicine as it is developing before us. This procedure has been advocated by a few and certainly has its merits. I feel, however, that most would agree that it would be very unsatisfactory from many aspects for us to add an additional year of training time to the already lengthy period a young man must spend between high school and the internship period in learning the fundamental facts needed for the practice of medicine.

Fourthly, we might return to a modified version of the European system for the training of physicians. Immediately after high school, students could be selected in relatively large numbers to start the work of the first of seven years in the college of medicine. The medical faculty would be responsible for giving the embryonic physician his total scientific training, other than that received in high school, as well as in the humanities. This training could be directed toward the field of medicine, to be taken up in earnest at a later time. A considerably larger number of candidates would be started in the first of the seven years than could be handled satisfactorily in the later years of medical school, and rigid elimination programs could be set up to screen the material available. This would probably contribute a great deal to the ease with which the scientific aspects of the medical subjects could be presented to the student in the later years of the medical course, but it is also subject to the criticism that we would be dealing with a highly specialized type of training which would prepare the young man for nothing more nor less than the study of medicine, and that in doing so we might lose sight of the finer aspects of training for the total man and the life he must lead. It is quite possible that there would be too great a tendency toward the neglect of the humanities and their application to the general life needs of the young physician.

It is obvious, however, that an answer, at least in part, must be attempted. Our premedical students must know more of the basic sciences before coming to medical school, and more importantly, they must know how to use this greater amount of knowledge which they bring with them. How, then, can we approach this problem on a sane and satisfactory basis?

The partial solution about to be presented is not foolproof, and will not produce results within twelve months. It would take time on the part of every medical educator in the country to put it into effect and to bring it through to fruition. We are busy men, but I wonder if we are too busy to do the very best possible job in our chosen profession?

It is necessary to point out that these remarks and suggestions to be made are not entirely theoretical. We have tried, during the past several years, in Texas, to put a few of them into effect with some success and we are continuing on with the plan just as rapidly as possible.

Instead of adding to the premedical or medical training program in length of time or in number of courses required to be taken prior to admission to medical school, it would be far better, and serve the purpose to a far greater extent to have better teaching and comprehension of the course work already being required. Several approaches to the solution of this problem might be followed. As all of you know, the average premedical teacher with no experience or knowledge of the content of medical courses, is unprepared to offer proper presentation of material or advisement in the course, of any particular benefit to the premedical student. Physics courses are offered, including all of the principles of physics, with very little application of these principles to the human body or to the major problems to be encountered later in medical studies.[1] In chemistry, very little reference is made to the fact that organic, quantitative and physical chemistry are the specific tools which must be used in order to understand and appreciate the chemistry of the human body, and of drugs and research in the field of medicine. Even in the biological sciences, in courses as advanced as comparative anatomy and embryology, the average teacher is unaware of the strict application of his subject to the needs of the medical student.

Of great cause for concern is the desire on the part of so many colleges to offer specially organized courses for premedical students. For some reason many premedical instructors seem to feel that a smattering of their subject is all that the premedical student needs since, after all, he is not preparing to be an "educated man" but only preparing to enter a trade or vocational school. This results too frequently in premedical students receiving either very little or definitely inferior instruction in subjects, instead of being enrolled in the regular courses offered by the department, through which much better preparation could be obtained.

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1. The American Association of Physics Teachers has been giving this problem serious consideration during the past two years, and hopes to have a report available shortly.

There is a solution for this. We, as medical educators must see to it that our colleagues, who are responsible for the training of the raw material which we matriculate, are able to understand our problems, and are enlisted in a co-operative effort for the betterment of premedical education. This cannot be done successfully through correspondence. It would be wise for medical deans, or representative committees from medical school faculties, to visit with arts and science deans, basic-science instructors and premedical advisory committees on the campuses of the colleges from which the larger number of their students come. One should be prepared to spend a day, or even longer, about once a year in contacting colleagues in the several schools; also, of great importance is the opportunity to contact the premedical students in training at the institutions being visited and to discuss with them their specific problems, urging them to do the best possible work and explaining fully the differences between the premedical program and the problems inherent in medical education.

As stated before, this is not a theoretical approach to the problem. We have actually been carrying this through to the fullest extent possible during the war years in connection with the schools in the State of Texas and we have found that we have been offered excellent cooperation wherever contacts of this nature have been made. Now that the war is over and transportation facilities are easier, we expect to organize a visitation committee at the Medical Branch composed of several key men who will help us in this contacting process. We are certain that, as a result of this ground work, within the next few years we will see a considerable improvement in the general premedical training level in the State of Texas. We sincerely hope that other medical schools to which some of our Texas boys will go, will be aware of the effects of our efforts in this direction.

With respect to the teaching of medical students, very little can be added to the ideas that have been presented at these meetings over the past several years. Some effort has been made at Texas to meet the problem. Orientation courses were organized for the last three freshman classes. Some review was given of the premedical science fields, but, primarily, the effort was directed toward correlation of the premedical subject matter with that to be presented in the medical courses. An evaluation of the results of these courses cannot be given as yet, but, in general, the students themselves have indicated that their understanding of the program to be undertaken in the study of medicine is much clearer as a result of these sessions than it would have been otherwise.

Beginning with the 1945 freshman class, an hour has been scheduled each week for an introduction to physiology, with primary emphasis placed on physics as it applies to the whole field of medicine. This course in biophysics is planned as an introduction to physical medicine. Here, again, it is too early to evaluate results, but, in general, the department of physiology feels that, as a result of the introductory course, the students have a somewhat better understanding of the basic principles involved in the regular course offered in the second semester.

In summary it should be said that we should make every effort to make the medical student conscious through correlation clinics, advisement and precept and example, of the problems before him, and to point out to the preclinical student the application of the work he is doing to the general field of the practice of medicine. Greater emphasis should be put on conferences and symposia rather than on didactic work. More time should be given to the students for elective work and for self development. We must come to the full realization that the average medical student is a mature adult and that high school techniques in teaching approach may yield very unsatisfactory results.

Whether we discuss education at the premedical or medical level we must realize that possibly the greatest effort should be placed on development of the analytical approach, ability to use knowledge, and the research attitude. Too many unsolved problems are left in the field of medicine for us to feel that all of the research has been done and there is nothing left to do. Further advances will be made in proportion to the ability of doctors to approach the bedside in the spirit of research with the ability to apply their knowledge analytically to the prevention of disease and the diagnosis and care of the patient.

Use of the Project Method in the Teaching of Histology

A Preliminary Report

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For some time past we have incorporated practical examinations on normal and pathological tissues, slide descriptions, demonstrations of special preparations, vital injections and the use of photographs and projections in the basic course in medical histology.

In the academic year 1945-1946, experimental and research projects, carried out by groups of students, were introduced into the curriculum for the entire freshman class. These projects were carried on during the first half of the year, paralleling in time the course in histology. Some of them were continued during the second half of the year after the completion of the course. The interest of the students in the projects and the benefits gained from the work, as judged by student opinion and our observations, encouraged us to elaborate the course.

It is possible that this type of project has been previously employed in the teaching of histology, but a report of it has not been found in a partial survey of the literature which was made after the completion of our one year's trial of this method. Some closely related plans are, however, reported in the literature but their applications have most often been in fields other than histology: Cowdry[1] suggested the application of the experimental method to the study of blood and to the study of postmortem degeneration, as well as to other phenomena. He also suggested that the experimental method might be used more extensively in other phases of histology to show the relation of function to form more effectively. In 1944, Booker[2] described a project method which he used in the teaching of pharmacology. He stressed the requirements and the value of such a program, particularly in the field of research. Venable and Papageorge[3] described an experiment, conducted in 1945, in reorganizing the first year medical curriculum. This program included seminars and certain extracurricular projects in various subjects designed to stimulate the student's initiative and to develop his responsibility and his desire to learn as well as to relate the subject matter of the first year courses. Sanger and Hurd,[4] in an article on the ideal medical curriculum, pointed out that among other deficiencies, the present medical schedule makes little or no provision for individual differences in students.

No one of the reports appears to have applied this specific method to the teaching of histology to an entire first year class in the very early stages of medical college work. Our experience with the method described not only suggests that it has value in teaching histology but, in addition, it may be used to accomplish the results enumerated below in other fields.

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* Contributions from the Laboratory of Histology and Embryology.

The method employed is as follows:

A list of experimental projects (Table I) is given to the class (40 students) in histology at the start of the course. Each student indicates by signature which problem he wishes to undertake. Some of the projects follow the same lines of research as are being carried on currently by members of the department. All of them involve the use of living animals. Student interest in specific problems may be judged by the selections of projects made by the students.

TABLE I.—TITLES OF PROJECTS AND SELECTIONS BY STUDENTS.

Project	Number of Selections Per Project
Wound healing in ascorbic animals	3
Changes in cells of Paneth with various diets	0
Histochemical study of tissue enzymes	0
Endometrial transplants to the rabbit's eye	4
Effect of cold on adrenal and thyroid	2
Experimental infectious mononucleosis in rabbits	3
Experimental carcinogenesis in rats	4
The effect of aloxane on the pancreas	7
The effect of ligation of the pancreatic duct	4
Determination of vitamins A and C in tissues	0
Experimental renal hypertension in rabbits	6
Nerve grafting and regeneration	7

Two to four students work as a team on any given project with readjustment of numbers as necessary.

Before any work is started, the instructor in charge of the project discusses with the group the nature of the problem, the bibliography and the method to be employed. These initial group conferences are informal and general discussion is encouraged. Each group is urged to review the literature which is found on a reserve shelf and also that obtained from other sources. The proposed procedure and technique as outlined by the instructor are subject to criticism by the students, who are encouraged to make suggestions for changes in the plan before the actual work begins. When the introduction and the plans are complete, appointments are made and the work of each group begins. A more or less flexible time schedule is necessary to accomplish the work without interference with other medical school assignments.

The experimental work is done in the animal house. Tissue sections and other preparations are made by the technical staff of the department. Students are encouraged to prepare their own slides and to do other technical work under the supervision of the laboratory staff, so far as their free time allows and their interest dictates. Students with special interest or experience in technical work take great interest in the preparation of their own slides and material. As a vital part of the program, the histologic techniques and analyses must be done carefully. Other departments of the College of Medicine collaborate in the phases of the work related to their special fields. Biochemistry, bacteriology, physiology and pathology are the departments most frequently called into consultation.

The conduct of each project is under the constant supervision of one of the instructors in histology. A staff member is always present during all important phases of the work. After the preliminary stages the students themselves do all the actual work, including operative procedures, blood counts and blood pressures, autopsies and the keeping of proper records. As the work progresses, more

and more responsibility is placed on the individuals of each group. The students themselves create the momentum which carries the work along. Several students have made suggestions for new techniques in operations and have presented new angles for approach to the problems. The interpretation of the results of the work, as made by the student, often show a surprising maturity of judgment and scientific reasoning.

Informal conferences and discussions continue to be held throughout the course of the work. In the conduct of the work there develops an informal, pleasant and mutually beneficial faculty-student relationship, which is one of the unique and desirable features of the plan. To have this informal collaboration of faculty members and students with individual instruction at the beginning of the medical course is most valuable because it comes at a time when the student is most enthusiastic and eager to learn. It helps to develop a sound, scientific viewpoint and to establish interests early in their medical education.

In assuming responsibility for the successful completion of the work, for the proper care of animals and for keeping accurate and adequate records, the student not only forms good habits of thought and action but he may also develop latent capabilities and interests. By actually carrying out the procedures he can see and grasp the practical application and relationship of his early work to clinical procedures and problems which he encounters later.

Many of the first year students in the war period have had experience that premedical students in ordinary times do not have. Some, for example, have served in Army and Navy hospitals and laboratories; others have worked in civilian hospitals, in nursing or in advanced courses in experimental zoology, chemistry, pharmacology and physiology. Such a class may profit more from these projects than would a class with the usual premedical preparation. Experience with and observation of future classes in this work will show how much the experiences of the war years are factors.

While effort is made to get each student to take an active part in the work, some students, because of their background, ability and interest take a more active part and are more successful in the work. This is to be expected. Any student is free to withdraw from his project at any time. Such withdrawal is recommended for such students as feel that participation in the program interferes with the work in any courses. There appears to be little or no interference with other courses of instruction. If properly planned and organized, the work can be done without detriment to the usual instruction of the first year. The grades in histology of the class which took the course appear to be on a par with the grades of previous classes which did not engage in this type of work. By their own decisions and due, in part, to technical difficulties and lack of adequate staffing for this additional work, about one-half of the class took a relatively small part in this program. The other half of the class continued the work regularly during the first half of the year and into the second half of the year. Some students continued the work into the summer, after the close of the regular college year. As there is no time limit to these projects, it is possible for inter-

ested and able students to continue work on their problems independently or in conjunction with succeeding groups or in other departments.

The attitude of the instructors toward this work is a vital factor in the success of such a program. However, the momentum for the continuation of these projects should be developed by the students and not by the instructors. In no case should an instructor urge the student to continue. As no grades are given for the work done one measure of the success of the course is the continued interest of the students.

These projects add considerably to the work of the teaching and technical staff. The student also finds it necessary to work extra hours. Greater experience in giving the course should help to reduce this extra work to a minimum and to improve the general program. Additional members of the instructional and technical staffs will be necessary for most departments, if the program is to be carried out properly. The curriculum must of necessity afford the student more free hours for elective work, if he is to obtain the maximum benefit from such a course. The work has been carried on during free hours, in the evening and at any time mutually convenient to students and faculty. Some of the projects require work at night. The students do this willingly but free hours during the day are mandatory.

It should be borne in mind that this is, primarily, a teaching program based on research problems which have an obvious clinical application. The work on the projects should be an introduction to research and should develop a continuing interest in research and medical progress. It is impossible for a student group to amass a large amount of data or to complete the work on any major problem in the course of one year in such a program. The amount of time available and the lack of scientific background on the part of a first year student make it impossible. These projects seldom provide much new information, although some of them contribute confirmatory and additional data by repeating the work of others or by following some more or less original lines of investigation.

The work done on each project is summarized and written up by the group. These reports are filed for future reference in connection with the development of this program. An important part of the work is to have each group present to the class a report on its project with general discussion of the work in the manner of a seminar.

In the conduct of all experiments and in the reporting and discussion of the results emphasis should be placed on the necessity for careful and exact scientific methods, accurate observations and records, sterile technic, humane treatment of animals and valid conclusions. The first year in medical school is none too early a period for the inculcation of these ideas. In the development of their various abilities, first year students should have opportunity to incorporate these essential principles in their mental and manual techniques.

In conclusion, it may be said that this method, under faculty guidance, stimulates the interest of freshman medical students, develops their powers of observation and scientific reasoning as well as their technical skills. It also

affords opportunity to become acquainted with current scientific literature and to appreciate the relation of histology to medical problems in general on a very practical basis. It emphasizes the relation of structure to function. It establishes a very helpful faculty-student relationship. It affords the student an opportunity to develop his abilities under adequate guidance and instruction. Students who participate in this work learn that valid scientific information is obtained by accurate and careful work and that this is a slow, time-consuming process, demanding accurate observations and records.

Several members of the class have chosen to write required papers in biochemistry and physiology on subjects related to their projects. This is a good illustration of the correlation and integration of courses accomplished by the project program. It helps to break down the tendency to work and teach in compartments, so frequently experienced in medical college groups.

The program has made for better teaching of histology. By enabling the student to carry out various procedures on living animals the course has been removed somewha from the routine didactic and descriptive realms to one where the student sees the relation of the subject to clinical problems. It, thus, becomes a vital adjunct to his future work as a physician.

It is our hope that each year will find improvement and expansion of the program. An increase in the amount of interdepartmental collaborotion is desirable. New problems and projects may be added. Individuals in the class with particular aptitude and training can be given more advanced work to do. Further experience with this method here, and in other institutions if it seems to be of sufficient value to be tried elsewhere, should lead to a completely adequate evaluation of its advantages in medical education. It is a flexible program and could, apparently, be used in other courses than histology. With extension to other courses each student could, for instance, participate in one or more of these projects during his first year, either in histology or in other anatomical fields, in chemistry, physiology or bacteriology.

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Problems of Integration in the Medical Curriculum*

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Such words as "integration" and "cooperation" have come to mean so many things to so many people that in this discussion we recognize the danger of sinking in the quicksands of confused semantics. We could discuss at length the finer shades of meaning of the word "integration." For our purposes, we can understand that we are speaking of the general concept that to "integrate" means to "make into a whole." The various organs of the body are integrated to form an organism. With this concept of integration, the words "organize" and "organization" have very appropriate connotations. A most stimulating discussion of the problem of integration appears in Dr. Angyal's book "Foundations for a Science of Personality." His description of the concept of the biosphere, and his discussions of integration may well be adapted to our present consideration.

We think of the curriculum as the prescribed course of study. The word "curriculum," like the word "integration," has many overtones of meaning which need not be elaborated. Dr. Gregg has suggested that the common element in medical education in America and in Europe is that each seeks to place uninformed minds that are eager to learn in effective contact with more experienced minds that are eager to share what they have learned. We can think of the curriculum simply as an arbitrary framework which is used as a focal point of interest and activity for achieving this general aim. The contact of minds may be direct and personal between student and teacher, or indirect (in time and space) through books and other media. The curriculum is merely a scaffolding. Our focus of interest is of course the product of the building process to which that scaffolding contributes.

This paper deals with problems. We are primarily interested in asking questions rather than in giving answers. The method of asking a question, however, presupposes certain directions of thought, and it is inevitable that as questions are formulated certain points of view be assumed or anticipated. We may, therefore, freely express certain opinions with the consciousness that they are supported by only the briefest theoretical acquaintance with the complex field of medical education. Some additional support may come from the enthusiasm of a neophyte who anticipates a serious study of the field during the next few decades. I am particularly grateful and conscious of the need for humility, in joining the discussions of this group, who so long have been blazing trails toward the solution of these problems. On entering a strange city early in the morning you have noticed how the commonplace takes on an air of attractiveness and romance. Little things are noticed which later on are never seen. There is a peculiar feeling of pleasure in the first view of certain streets, buildings, and many things which later on, as one becomes more familiar, are not even seen, much less en-

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joyed. Perhaps in the enthusiasm of my beginning acquaintance with the field of medical education I am stimulated to look in some directions which later I would have a tendency not to see and appreciate, after the flood of routine duties of medical school administration have inundated many of the subtler points of interest.

The medical school as a unit, or a whole, may be likened to an organism, and its departments to organs. Proper functioning of the organism results from mutually dependent and coordinated relationships among the various organs. Problems of curriculum integration reflect primarily the problems of the proper relationships of the organs—or departments. Similarly, the medical school may be considered as a single organ in the larger social organism. Problems of integration involve, then, both (1) internal and (2) external relationships.

The problem of internal relationships is no longer the relatively simple one of making a coherent whole of the teaching activities of the four years of undergraduate study. It is necessary to consider also the years of graduate training in internship and residency. This magnifies certain problems to make them increasingly visible. We are mentioning six such problems.

(1) The great problem that looms ever larger is time. How can we reconcile the rapidly increasing content of medical knowledge and practices with the stability of the human life span and the biological maturing process? (2) How much of education is rightfully concerned with facts and "what to think" as compared with correlations and "how to think"? (3) What about the holistic as contrasted with the segmental approach to learning? (4) Can the functions and relationships of general as contrasted with specialized education be more clearly defined? (5) There is always the old question of the balance between content and method. (6) How can we overcome the difficulties of defining aims and measuring results?

1.—Even if the Russian experiments portend a doubling of the life span, we are still confronted with the necessity of a more adequate adaptation of the years spent in formal education to the biologic maturing process. This is a matter of grave economic and eugenic importance. We must reduce the age at which a physician can support a family and still obtain the best training. The years spent in training can certainly not be further increased unless a complete answer is found to the inadequate "sweat-shop" wages now offered physicians pursuing graduate training. (It would certainly seem that the social contribution of these men deserves the compensation of a living wage.)

Unfortunately, we may have to retreat before we advance in the matter of time, because of our slow development in increasing the efficiency of the learning process.

In the evolution of graduate training, there exists an excellent opportunity for setting patterns of study which integrate the clinical and basic sciences. There seems to be an equally great danger of exaggerating the disadvantages of the traditional compartmentalized approach, by suggesting that large blocks of time be set aside for full time attention to various basic sciences.

How can we incorporate into the curriculum the new emphases on factual content and points of view which new developments are constantly bringing? Obviously, the traditional departmental approach is inadequate to meet this problem. Many subjects cannot fit into existing departmental patterns; and yet they demand attention. On the other hand, many of these subjects could very easily be handled as an integral part of the content of various existing courses. Would it help if our methods of analysis went beyond the departmental level so as to consider the content for each day's work? Can methods be found for eliminating the duplication of effort among various departments? How best can we build into the existing curriculum the new things which must be brought in without developing top heavy structures with an ever increasing number of courses and departments?

2.—There is an increasing acceptance of the hopelessness of attempting to teach all the pertinent facts. The crowding of the curriculum content with masses of detailed facts has required an authoritarian approach which is the antithesis of the scientific method and habit of mind which should flourish in a medical school. Requiring rote memory of massive factual material has contributed largely to the psychology of fear which interferes so tragically with the learning process among medical students—especially freshmen. A current rebellion against the factual content favors a broad approach of developing methods of observation, thought, evaluation, and synthesis. The wholesomeness of this approach may be endangered by overdoing the factual housecleaning to a point where the student is left without sufficient guidance in ready access to essential factual content. What is the proper balance between factual content and training in methods of thought; and how is this balance best achieved?

3.—Many are now demanding an approach to knowledge based on units which we might consider as being horizontal rather than vertical, i. e., concerned with certain problems or functions or parts, rather than with specific subject matter categories. Effecting such a change is a tremendous undertaking.

One evidence of the modern trend toward holistic concepts is the increasing emphasis on treating persons rather than diseases. Could it be that one of the best ways of developing this point of view would be for administrators and teachers to give more attention to treating students as persons? Could one key to successful integration of the curriculum be found in a more serious consideration for the growth and development of each individual student? Perhaps the growth pattern of the mind of the individual student deserves a priority above the content of the mind of the individual teacher.

4.—Just as "little fleas have lesser fleas," so the question of special and general education is one of multiple relationships. Within the specialized training for medicine we are faced with general and special medical education, and even special training within specialties. Present aspects of medical-premedical relations pose many interesting problems of general versus special education. The accepted approach is to obtain a general education and then to superimpose on that the specialized training which is desired. One hears with interest the question of whether we may be forced to devise a method for combining spe-

cialized and general education so that a man's training in the special field of medicine will also provide the basis for a broad general education.

5.—If time must be saved while content continues to increase, the only possible hope is an increase in the efficiency of the teaching and learning processes. There is among teachers of scientific subjects a traditional lack of confidence in educational theory and method. Misinterpreting the concept of academic freedom, an occasional subject-matter expert has perpetrated educational atrocities which his co-workers in his own medical school might have helped him prevent. But the disregard of method has been so complete that we have not even established adequate channels within most schools for sharing our own experiences. The efforts of this group are, of course, aimed at this very problem. An interest in and respect for method would seem to be prerequisite to widespread progress in integration in the medical curriculum. In many quarters a fixed faith in the ubiquitous need for "mental discipline" results in a curious repudiation of new available techniques which make learning easier and less time-consuming. Instead of cooking with gas or electricity, educationally speaking we are still going out into the forest to chop fire wood. And worse, we often try to chop kindling wood with razor blades. The distinction between basic principles and nonessential accessory material has not always been clear. There has been an incomplete analysis of content as regards the distinction between skills, requiring certain training methods, and concepts calling for other types of learning. How much of the work of present medical schools is vocational training, and how much can be called true university education?

6.—At a recent conference of university teachers of science an amazing statement was made. A responsible foundation representative was quoted as saying that it would require one hundred years to answer definitely questions of the relative value of survey courses as compared with the traditional type. This view, while representing an extreme in pessimism, is a shocking reminder of our lack of adequate methods for measuring the results of educational efforts. This certainly is one major problem. How can we tell when efforts at integration achieve the desired results? The traditional emphasis on amassing facts, with too little regard for understanding, further confuses the issue. I wonder if some of you share the impression that results of the ordinary type of examination have a doubtful correlation to the things we are seeking most to achieve with students? And what are we seeking to achieve? The question is often assumed to be answered, but how much common agreement is there as to what the answer is?

The "external" integration of the medical curriculum involves relationships to the community and to our total culture. Time does not permit a discussion of the problems of relationship of the medical school to the university; to the city, county, state, or region; to our total educational and social structures; or to our general culture—present and future. But it might be well to raise the question of the relation of progress in such "external integration" to the probable success of efforts at "internal integration" in the medical curriculum. One also wonders how closely related such "external integration" may be to the speed of development of a newer positive approach to human health, and to the de-

velopment of a newer human biology which may well prove to be the heir apparent to the throne now occupied by modern medical science.

When analyzed, the problems of "internal" and "external" integration of the medical curriculum are basically the same. They are both specific examples of general problems which appear in many varied forms in our modern society. One of the basic dilemmas is the question of specialization vs. integration. The history of organic evolution offers arresting testimony as to the correlation between over-specialization and species survival. Increasingly specialized effort is the keystone of our accepted standards of progress. Closely related is the functional counterpart of the same generality—the question of optimum division of labor vs. optimum self-sufficiency. The principal problem is the same, whether found in jurisdictional disputes among labor unions or in plans for training auxiliary personnel in the medical sciences. A third general consideration is the balance between production and distribution. Here again the principle is the same for industry, agriculture, or education. The question we raise is: In our present society, how far have specialization, division of labor, and production forged ahead of integration, self sufficiency and distribution? Is the gap too wide? How can a more equitable balance be established?

Problems of integration in the medical curriculum are hard because they are, in effect, these same basic problems. But it also means that they are proportionately greater in importance. Progress toward their solution will not only provide better medical education, but will also suggest practical methods for solving other problems, basic in many areas of modern society. Practical steps toward solution must be made within the inherent limitations of the persons and systems involved in the problems. This is something big. There's no use hunting elephants with a B-B gun.

As Dr. Angyal suggests, we are accustomed to thinking almost exclusively in terms of specific cause and effect relationships, reduced to two factors by ruling out all variables. Consideration of integration requires thinking in terms of multiple positional relationships. For this type of thinking we have not yet developed an adequate frame of reference as a basis for dependable methods. Who would be better able to help develop such a frame of reference than a group of competent men attacking problems of integration in the medical curriculum?

As a rule, full time practicing physicians are so busy with more pressing needs, that they cannot make the investigations which result in the major progress of scientific medicine. At present, the field of medical education has many practitioners; but it is woefully lacking in investigators who are sufficiently supported with staff and budget to make real scientific progress a reasonable hope. Unless sufficient support in money and in competent manpower is provided, can we expect any real progress? How long will we continue to depend upon busy practitioners to provide basic scientific research? We don't tolerate this view in clinical medicine. Why tolerate it in medical education? How many medical schools support a serious program of investigations in medical educational methods?

There are undoubtedly many reasons why research in this broad field lacks respectability and appeal. One would guess that reason number one is the difficulty of the problem. It is just too hard. Then there is the common misconception that the laboratory worker who is labeled "scientist" has a monopoly on the reliable methods for discovering the truth. The resulting condencending disdain of workers in more complex fields is often defended by reference to a vague distinction between "science" and "philosophy." We are beginning to realize that many of the expressions of this view are immature to the point of being juvenile, and that they sometimes reflect an intellectual provincialism that is hardly a credit to the reputation of a competent research scientist. This is the fault not so much of individuals, as of our total modern culture. Unfortunately, it is probably true that the majority of superior minds have been attracted to investigations of problems in which the variables are fewer and more easily controlled. There are many evidences, however, of an encouraging awakening to the fact that these more difficult problems offer a challenge worthy of the efforts of increasing numbers of our most critical, scientific, and creative minds. The problems are so closely related to the general problems of human behavior that we may hazard the guess that this field will be the connecting link between the broad areas of "scientific medicine" and "scientific medical education." Is it reasonable to think that an emerging "scientific medical education" is the only hope in view for providing the adequate analyses prerequisite to the various syntheses that will constitute integration of the medical curriculum?

Attempting accurate description (or analysis) of the materials with which to build (or synthesize) leads us into deep water. We confront staggering questions. How can we harness effectively the resources of "the group mind" of a medical faculty? How can effective channels be established for sharing in the shortest possible time the best each has to offer? How insure a mutual stimulation for continued growth and increased capacities for growth among faculty and administration as well as among undergraduate students?

The ambitious investigators, or more practically, teams of investigators, face problems of developing more adequate tools, equipment, and experimental apparatus. Administrative and organizational machinery, together with all the various methods for the management of information, constitute the laboratory apparatus and gadgets for these complex experiments. The research scientist often spends days, weeks, or years personally developing his apparatus and gadgets. He also justifies large expenditures of money for obtaining competent technical help in building complicated apparatus. Human relationships are complicated.

The present widespread dissatisfaction with methods of medical education is a most wholesome sign. It suggests a look to the future rather than to the past. It is the most effective possible tribute to the monumental accomplishments in this field during the past half century. It portends decades ahead of accomplishments even more admirable and significant—accomplishments far beyond the efforts of any individual, or even of a group such as this. A new day has dawned. I have an abiding confidence that it will be a brilliant day.

An Improved Technique for Didactic Instruction in Medicine*

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INTRODUCTION

One of the most advanced forms of scholastic training is that received by medical students in their junior and senior years. In the senior year, the case method is used to a great extent. However, in the junior year the instruction is largely of the didactic type. While the aim of all pedagogy is to teach the student to reason for himself, it is recognized that the elementary student in any field must be given some facts which can be used at a later date in the thought processes. The junior medical student is, after all, only an elementary student as far as the subject of internal medicine is concerned. Therefore, it becomes the initial aim of the instructor to impart a reasonable quantum of information on the essentials of this tremendously complex subject to the junior student.

Prominent educators have written many volumes on methods of instruction on almost any subject. However, in the field of medicine there has been an appalling lack of any scientific effort to improve the calibre of the pedagogy. It is our purpose to present a method of teaching didactic medicine to junior students, which, in comparative studies, has proved superior to other types, with particular reference to the time worn quiz section method.

OUTLINE OF THE METHOD USED

In the University of Illinois, the didactic course in junior medicine is given in three quarters of about twelve weeks each. The entire class is divided into groups of from 21 to 23 students, each group being under the supervision of an instructor for one quarter. The groups rotate so that there is a change of instructor each quarter.

To correlate the work of the different groups, the head of the department issues uniform reading assignments in the textbook of medicine at the beginning of each quarter. The groups meet separately once weekly, the exact details of teaching being left largely to the individual instructors in order to encourage initiative and new ideas, and to provide flexibility in the classroom situation. It is essential that the student be stimulated and guided. Here and there, correction and interpretation will be needed. The head of the department composes the final examination which is given to all groups.

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The method of instruction most commonly used in medical schools consists of oral quizzing of the student over the assigned material. This results in the class periods really being quiz sections. It was felt that this was not a good method of instruction but was merely a method of checking how well the student may have memorized the text.

After three years' trial of various methods the present technique of instruction was developed. This plan consists of four parts: (1) Weekly reading assignments. (2) The mimeographed supplementary material. (3) Student research. (4) Class discussion.

1. THE WEEKLY READING ASSIGNMENTS.

Obviously, this is a basic step in any course. The student must have some preliminary knowledge on which to build his foundation in medicine. In those courses in which it makes up the principal mode of instruction, it usually is followed by the routine method of quizzing.

2. THE MIMEOGRAPHED SUPPLEMENTARY MATERIAL.

The primary purpose of the course is to ground the student in the essential fundamentals of internal medicine. It is manifestly impossible for a student to digest adequately 300 pages of a textbook in twelve weeks. Even if such a feat were possible, he would have little conception of the relative value and proper correlation of what he had learned.

At the beginning of the quarter, the student is given three master sheets. One of these is a weekly schedule of the mimeographed topics. The number of topics per week is usually one per week during the first quarter, and two per week in the second and third quarters. Each member of the class receives a copy of the mimeographed material.

This material is not found as such in a textbook. It represents the conception of a disease by men active in the practice of internal medicine, but on a student level is directed toward giving a more mature and practical overall picture. In general, it organizes and stresses the essential facts of a disease or group of diseases under consideration. Every attempt is made to present all practical and necessary details and to be up to the minute. It is in outline form since it is easier to correlate and place relative emphasis with this structure. In general, symptoms and signs are stressed, but treatment, pathology or differential diagnosis are included when indicated.

It is explained to the student that these notes are designed to show him the manner in which he should go about tabulating in his own mind the important facts about a disease. Only very important topics are included here and the student is told that he must know these topics thoroughly. While, in general, this material is given in outline form, in many instances the notes go into far greater detail than is found in a standard textbook of medicine.

Originally, the supplementary material was given orally. However, this was discontinued, primarily because of the fact that a lecture would occupy most of the period, thus monopolizing precious time which should more profit-

ably be devoted to the remaining portions of the course. Further, the students were rushed in taking the notes, and many of them put the material down in a haphazard fashion, losing the value of the outline form. The class reaction to the use of the mimeographed notes was highly favorable.

3. STUDENT RESEARCH.

The work in the junior and senior years is quite different. The senior is in possession of certain facts which he can use as a basis for medical thought. The senior term paper and seminar class is his introduction to a more advanced type of thought in which he begins to recognize the outposts of medicine. The experience of one of the authors in the formulation of a senior seminar class in medicine aroused interest in its possibilities in teaching junior medicine.

Each student is given a special topic with research possibilities. These topics are ones that are pertinent to and correlated with the particular sections covered in the quarter's work, as will be noted by referring to the master sheets given for the first quarter. Using the current periodicals as source material, he writes a paper of from 12 to 22 pages with a minimum of from 15 to 20 references. On a previously assigned day, usually two students present their papers before the class using only a small card of notes. Discussion is led and questions from the class are answered by the student following his presentation.

Six advantages were felt to accrue from this feature of the course:

(1) The oral presentation of the material affords the student experience in offering his ideas in public in an attractive and personable manner. Since a maximum time of 13 minutes is allowed, he has to learn to eliminate non-essentials. The successful practitioner must do this very thing many times during his professional day and his patients and colleagues often judge him accordingly.

(2) This research allows the student to prepare in great detail some single subject. This careful study not only invariably leads to a lasting interest in the assigned topic, but more important, frequently arouses his curiosity and pursuit of related medical problems.

(3) The student soon discovers how little he really knows about a subject from his ordinary class work, and, therefore, how incomplete is his knowledge of medicine. It is hoped that he may thus gain that humility and modesty that mark the truly great physician.

(4) The presentation of the research work provides the class with the latest information on the subject.

(5) This method allows the presentation of topics of importance, which are not included in the supplementary material and/or assignments. The class is held academically responsible for the presented research material.

(6) It was felt that the incorporation of the seminar feature into third year medicine saves the course from being merely a dry memorization of facts.

In the authors' experience, the student research adds to the popularity of the course in third year medicine. The junior student likes to feel that he is

entitled to some of the opportunities offered to the senior, and it affords him a diversion from his somewhat boring factual progress.

4. THE DISCUSSION SESSION.

The discussion session affords maximum opportunity for the instructor to provide that personal stimulation and inspiration which are lacking in the average quiz course. Only about one-half of the period can be devoted to this part of the course, since the first half is given over to the presentation of the student research.

The session may follow one or more of the following general lines: (1) Discussion of the student research; (2) interpretation of textbook assignments; (3) clarification of problems suggested by student questions; (4) consideration of cases involving diagnostic problems; (5) presentation of the ethical, moral, financial and fraternal aspects of the practice of medicine; (6) an occasional brief period of carefully chosen, thought type questions for spot quizzing to make the student aware of his textbook responsibility.

Discussion of the term paper is of great value. Much of the term paper's material covers experimental and highly detailed theoretical data, some of which are contradictory. The instructor can summarize and correlate this information in order to impress the essential facts on the student's mind. Clinical application of the material can be demonstrated to great advantage.

The student will have many questions, and every attempt is made in these discussions to have the students participate actively. By encouraging these questions, the class can often be brought to the point where everyone wants to talk, controversial statements fly, and the students will readily remember the disputed topics about which they have been thinking.

Presentation of cases involving diagnostic problems proved to be a stimulating method of teaching. If possible, cases which had come to autopsy were discussed. Every attempt was made to present the data in the way in which they would come to the physician who was first called to see the patient. The student was obliged to ask for laboratory work, progress notes, etc.

In connection with these cases, presentation of the ethical, moral, financial and fraternal aspects of the practice was often very apropos. Since much of a man's real success depends on these very things, and because they are so much neglected in the routine of medical education, it was felt that they should receive ample consideration.

Occasional spot quizzing was used to make the student aware of his textbook responsibility and to warn any laggards in the class. It is unfortunate but true that certain individuals need to be a bit fearful in order to do their best work.

CORRELATION OF THE FOUR PARTS OF THE COURSE

It is felt that the principal elements of the pedagogical requirements have been satisfied by this scheme. The demand for a broad factual basis of medical

knowledge is supplied by the text assignments. Especially organized, correlated knowledge is supplied by the mimeographed supplementary material. Student research contributes much to the medical maturation of the developing physician, as has been related above in detail. The discussion session, as previously outlined, gives the student orientation necessary to accomplish the transition from his class work to clinical medicine. No one of these parts can be used alone successfully in an elementary class such as junior medicine. Combined they comprise what we at present consider to be a most efficient method of teaching didactic medicine.

COMPARATIVE STATISTICS

Comparisons were made on controlled groups: (1) Between students trained by the above system, and those trained by the discussion method alone. (2) Between students trained by the above system, and those trained by the old oral quiz method. It was not felt that comparisons could be made between groups taught with and without the term papers, since there was a lack of a true figure that could express the differences.

A comparison was made of grades on students trained by this method and those trained by oral-quiz-discussion method alone, Instructor A being in charge of the class. The group averaged a grade of 76 as compared with one of 83 for the group trained by the complete improved technique by Instructor B. Two other groups trained by the oral quiz method alone were regraded on the same basis as the groups of Instructors A and B, and averaged a grade of 73.

In the second quarter this same group that averaged 76 was trained by the full method as outlined by Instructor B. The average class grade was 87. During this second quarter, Instructor A, using the same full method had an average of 85 on his group. All papers were graded jointly. Control papers from two other oral quiz groups averaged 75 on regrading.

From a grade standpoint, the superiority of this system in teaching the essential fundamentals of internal medicine is clearly demonstrated. We have felt strongly that the acquisition of essential facts is the primary aim of this course, and have not allowed any of the additional portions of the work to sway us from this objective. In fact, we have found that the inclusion of the other portions of the course has complemented rather than detracted from mastery of the factual material. Its superiority is also shown by greater student enthusiasm, higher percentage of attendance, stimulating class participation and almost glib acquaintance with current literature. If student sanction can be construed as a valid criterion, the success of this technique is further evidenced by tht fact that as time passed, the system became so popular with the students that they began mimeographing and distributing the printed notes widely throughout the class.

CONCLUSION

An outline of a method for teaching didactic medicine is presented, comparisons indicating that in many ways it is superior to the routine quiz section and various other methods of instruction.

FALL QUARTER
Junior Medicine Assignment
Textbook of Medicine—6th Edition—CECIL

1. Pages 1- 20 Virus Diseases to Measles.
   Pages 31- 34 Herpes Simplex to Varicella.
2. Pages 49- 56 Psittacosis to the end of Hydrophobia.
   Omit Polio.
   Pages 63- 95 Encephalitis to Bacterial Diseases.
3. Pages 95-134 Bacterial Diseases to Streptococcal Infections.
4. Pages 135-145 Streptococcal Infections to Scarlet Fever.
   Pages 155-171 Bacteremia to Meningococcal Infections.
5. Pages 435-449 Rheumatic Fever to Erythemas.
   Pages 172-180 Cerebrospinal Fever to Bacillary Infections.
   Pages 193-199 Tetanus to Typhoid Fever.
6. Pages 199-239 Typhoid Fever to Pertussis.
7. Pages 244-275 Glanders to Onset of Pulmonary Tuberculosis.
8. Pages 275-314 Onset of Pulmonary Tuberculosis to the end of Prevention of Tuberculosis.
9. Pages 314-352 Friedlander's Bacillus Infections to Yaws.
10. Pages 353-383 Yaws to Trypanosomiasis.
11. Pages 383-434 Trypanosomiasis to Rheumatic Fever.
12. EXAMINATION.

WEEKLY OUTLINE
First Quarter Junior Medicine
(Fall Quarter)

	LECTURE	TERM PAPER
1st week	Typhus	DD of acute respiratory diseases around Chicago
2nd week	Pneumonia	Temperature curves in U. S. fevers as an aid to DD
3rd week	Cerebrospinal Fever	Rashes in adult fevers in U. S. as aid in DD (exclude Ped. cause)
4th week	Brucellosis	DD of fevers with CNS involvement
5th week	DD Tetanus	Prolonged Pyrexia
6th week	Examination to page 275	
7th week	Tuberculosis	DD of early TB
8th week	Amebiasis	Pyrexia without obvious cause
9th week	Malaria	Discussion relative to use of Penicillin, Sulfa and Streptomycine
10th week	Rheumatic Fever	Inhalation Therapy with antibiotics
11th week	Typhoid Fever	Skin testing in fevers

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Place of 1947 Meeting

The Executive Council has decided that the 1947 meeting of the Association of American Medical Colleges be held in Sun Valley, Idaho, in the Challenger Inn, October 27, 28 and 29.

This change in place of meeting was necessitated by the fact that the rates at the place selected at the 1946 meeting were too high. This was also true of other places contacted—and in some of these, the time available was not desirable for the Association. It seems that resort places are becoming increasingly popular for holding conventions. Perhaps, that accounts for the extraordinary increase in rates. Furthermore, some of the resorts charge for the use of meeting places—as do some hotels.

Sun Valley is about 40 hours travel distant from Chicago by rail. It can also be reached by plane. It is situated on the main line of the Union Pacific Railroad. It is a beautiful and well known resort and the management has promised to give special attention to the Association, doing all in its power to help to make the meeting a successful one. The rates are reasonable. Details on travel, program and other items incidental to the meeting will be forthcoming later.

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The Curriculum

A certain topic of conversation at every meeting of deans and other medical educators is the curriculum. There is complete agreement that it should be reviewed. A few attempts have been made toward this objective but, on the whole, the curriculum is today what it was fifty years ago. One notable attempt at making a change was the introduction of the so-called "block" system. The proponents of this system favored presenting subjects in the curriculum, especially in the preclinical years, one at a time—like the courses of a dinner. They claimed that the student would profit from devoting all his time to one subject, going on to the next when he had completed that one. It was a sort of stuffing process. The plan failed of general adoption and eventually was abandoned by the few schools who had used it.

Largely responsible for the failure of this plan was the hue and cry raised about "water-tight" compartments. First, the whole course in medicine consisted of four separate and distinct years, usually grouped as two preclinical and two clinical years. And, second, into each year were crowded subjects without any particular regard to relationship, connection or integration. Having completed a course in any subject, there was no attempt made to revert to it later. True, it was assumed that the student had full knowledge of and was well versed in all that had gone before. No one gave thought to the fact that the passing of time and forgetting go hand in hand, especially when little, if any, attempt had been made in preceding years to point out and stress the importance of remembering—if what followed was to be understood.

The drive against "water-tight" compartments did some good. Medical education began to shy away from the old hard and fast curriculum to a slight degree. They began to talk about revising the curriculum, especially when they were beset by demands for more hours in this, that or the other subject and time for new subjects, subjects not previously represented in the curriculum. To give more time, there was talk of

reducing "overlapping." Two or more departments were teaching the same thing. Time could be saved if that were stopped. Of course, there were teachers who believed that repetition has value in learning. The oldest medical curriculum was a repetitive one. The year was of six months' duration. It was repeated once—and at the end of the second year the student was graduated. But the rapid growth of knowledge in medicine demanded a lengthening of the course, both in months and years, until we came to where we are now—four years each of approximately eight and one-half months' duration. We added subjects and time but we have given little thought to sound pedagogy. Pedagogically, the medical curriculum is entirely wrong, although in that respect it does not differ from the curricula set up in other fields of education.

It is of the greatest importance to impress on the student why he must know this and that; that there is close relationship between all the subjects in the curriculum. If this were not true, they would not be included in the curriculum. Little, if any, attempt is made at integration and correlation, the real objectives of good pedagogy. Too much abstract teaching is being done. Revision is not a matter of reducing time or eliminating subjects. It should concern itself more with integration and correlation. Departments should get together and build their teaching programs on that basis. If the so-called preclinical subjects are of importance, then why not tie them in with the clinical subjects? That can only be achieved by integration. If, for example, it is important that the student have knowledge of neuroanatomy, then would it not be sounder pedagogically if he studied that subject in the third year when he is entering on his clinical clerkship rather than in the first year when he did not have the remotest idea why he should know anything about that subject? If the course in anatomy, in physiology and in the clinical subjects were correlated and integrated, the road would be much easier for the student to travel and his real knowledge and understanding would be much greater than it is under the present system of teaching. True, much time elapses between when it is taught and when it is needed. The present curriculum is a challenge to memorizing—not to thinking. It is a stuffing process, giving little opportunity for digestion.

The Association of American Medical Colleges appointed a Committee on Curriculum at its meeting in October, 1946. It has also given place on several programs of the annual meetings to papers dealing with the curriculum as well as with pedagogy. The Council on Medical Education and Hospitals of the American Medical Association has also announced that it will make a study of the curriculum. Perhaps, the curriculum will be revised after all.

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A Teacher of Public Health Looks at the Curriculum

A the recent Conference of teachers of public health and preventive medicine, Dr. Perrin H. Long of the Johns Hopkins University School of Medicine, made some very pertinent and appropriate remarks about the medical curriculum. He said:

"From the day a student enters medical school, practically his total outlook is focused upon diagnosis, and if he is surgically inclined, treatment. Anatomy, bacteriology, biochemistry, physiology, pharmacology and pathology are more or less exciting and at times completely isolated milestones along the road to the clinic. All of us can remember the excitement and the intense satisfaction which pervaded us when at last we had worked up our first "case." We had a feeling that we had arrived. The philosophy of clinical teaching at the bedside, so laudable in its inception, because it took medical students from lecture halls into hospital wards, has become restricted in its concept. The interest of the medical student is focused on the sick man, recumbent in a hospital bed. But slight attention is paid to what brought the patient to the hospital, and when due to his own natural

resistance, or to the administration of one of the few "specifics" in modern medicine, he becomes ambulatory, interest in him rapidly wanes. Little consideration is given to his problem of convalescence or to his physical and mental rehabilitation. Medicine today has become more specialized and also more technical with the result that its students are required to assimilate vast quantities of precise and intricate information. This is the result of the remarkable progress which has characterized medicine during the last quarter of a century. With the continuous increase in the definition of our knowledge, medicine and the teaching of medicine have tended to be compartmentalized in our medical schools. Disease has become a jigsaw puzzle, the integral parts of which are rarely ever put together by one individual to obtain the whole. Specialists and corps of technicians are required for its solution. Research is "directed and coordinated" because it is thought that many fields have become too broad for the individual endeavor. Is it any wonder, then, that the instructor and student, staggering together under the impact of the increasing and continuous flow of new medical knowledge have little time, as Ryle said, "for the aetiological interest and humanism of our fathers." It is beginning to appear that the more they learn, the less they understand. The eminent specialist, the great worker in research, and the expert and dextrous surgeon have become the gods of the students and specialization their goal."

How true! Pedagogs and curriculum makers pause—and think. Now that revision of the curriculum is receiving widespread attention and consideration, the time has come to bring that instrument up to date in line with good teaching and sound thinking.

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Preventive Medicine and Public Health

Early last October a conference was held in Ann Arbor under the aegis of the School of Public Health of the University of Michigan, which deserves the highest commendation. The attendants at this meeting were individuals who are actively engaged in the teaching of undergraduate medical students in the field of public health and preventive medicine. All of the papers read at this conference gave evidence of thought and experience. Some of them will be published in this JOURNAL. Space forbids publishing all the papers read, which is a pity because not only those who are active in this work, but every member of the faculty, and, especially the administrative officers, will do well to read these papers and make every endeavor to put into practice in their schools the recommendations made at this conference. These men are not asking for more time. They are presenting a rational program of operation and an earnest plea for cooperation on the part of every member of the faculty to the end that physicians will be better prepared to function in the field of preventive medicine and public health. The recommendations made are so specific that guess work is completely obviated. It is impossible to single out any one paper for special commendation because all the papers are good. No doubt, copies of the proceedings of this conference can be obtained by writing to the School of Public Health, University of Michigan, Ann Arbor, Michigan.

One of the recommendations made at the conference was directed to the Association of American Medical Colleges. It reads as follows: "The Association of American Medical Colleges . . . be strongly urged by a formal communication from this Conference to consider the matter of the requirement of instruction in the social sciences (sociology, economics, government and psychology) as prerequisites to admission; at the sacrifice, if necessary, of some of the present requirements; and that this change in requirements be instituted as soon as possible."

As a matter of fact, the Association has for ever so many years urged these (and other) subjects in addition to the required subjects of chemistry, physics,

biology and English, with the thought in mind that it would not only broaden the student's education but that it would also give him a better preparation for the practice of medicine. It is not possible to prescribe every subject it would be well for the student to take in college. That would be regimentation and stifle initiative. Something must be left to his choosing. Unfortunately, too many students choose so-called "snap" courses, courses easy to pass—but in the interests of good education that cannot be changed. Student advisors do the best they can—but in the end, the student is the boss. Too often he is merely anxious about "passing." That is the reason he chooses easy courses. But there are some who do not follow that road. In them lies our hope for better things to come.

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Research by Medical Undergraduates

With the thesis presented so effectively by Dr. Doan,* I am sure there is full accord. I will describe briefly one way in which research by medical students has been encouraged at the University of Rochester School of Medicine and Dentistry. I refer to our Student Fellowship Program, which was inaugurated some 20 years ago by Dean Whipple.

A medical student is offered the privilege of working in one of the school's departments for a year as a Student Fellow. As such, he (or she) receives a Fellowship grant of $840 out of which he pays for his maintenance in the Staff House at a rate of $50 per month. He pays no tuition. He may pursue a research program of his own devising if he has a special interest he wishes to explore, or he may—this is more usual—participate in some going departmental investigation. He may help in teaching the medical students in the class behind him as a laboratory instructor. He may be asked to work up topics for presentation at seminars or to prepare a few lectures.

* Doan, Chas. A.: Research and Medical Education, J. A. A. M. Colls., 22:10 (Jan.), 1947.

By living in the Staff House, the Student Fellow comes to know intimately men who are a few years ahead of him, learns what will be required and expected of him as an intern and resident. Visiting fellows, special students from abroad, and younger members of the faculty who also live in the Staff House become his daily companions. Thus, by interrupting for a year his regular progress through the four year medical curriculum, the Student Fellow gains real insight into what is ahead and has the leisure to prepare himself to embrace his opportunities to the best of his abilities. This interruption may occur anywhere in the medical course—most frequently the year "out" is taken after the second year of medical study.

Before World War II disrupted the Fellowship Program—fortunately, it is well under way again—some 10-15 per cent of our students spent the extra year as a Fellow. I have yet to find a student who thought his time misspent; quite the contrary, most of the students are enthusiastic about what the Fellowship year has meant to them. Many tell us that the year has helped them define more clearly than before their medical objectives. It has taught them to read critically, to organize their efforts, to integrate their knowledge, to see for the first time how new information is acquired. Most of our student Fellows qualify for the "M.D. with Honor"—the honor degree in medicine requiring, among other things, the preparation of a thesis in which original work is reported. Such research work, begun during the Fellowship year, is usually continued throughout the rest of the medical school days and often thereafter, resulting in the publication of a considerable number of papers by our students before they finish their medical schooling. Happily, some of our best students have set their course toward academic careers during the period of their Fellowship.

It is sometimes objected that medical training is already so long that a student should not prolong it as I have described. Following graduation, most of our Student Fellows feel that they have more

than "made up" the time spent through learning a more effective use of their talents. Criticism sometimes takes the form that the extra year would be spent better after the acquisition of the "M. D.," when an individual knows more clearly what he wants to do. Unquestionably, this is true in some cases. On the other hand, we are confident that the reverse is as often true—by serving a Fellowship, a student learns early how to embrace his opportunities more efficiently.

That many more students apply for Fellowships than can be accommodated is evidence of how highly the privilege is regarded. We try to give Fellowships to the students who we think will profit most. This is often an individual whose performance is below what we believe it should be in terms of our appraisal of his ability. Frequently, it is remarkable how such individuals improve when they return to the work of the regular medical curriculum.

GEORGE PACKER BERRY.

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An Educational Awakening

By a vote of the Faculty of Arts and Sciences, Harvard College has discontinued the B.S. degree and will after this grant the A.B. degree only. Effective for the graduating class of 1950, the new regulations for the Bachelor's degree will require that the candidate for admission to Harvard College present a satisfactory secondary-school record, including three years of Latin, two years of Greek, or three years of mathematics. Exceptions may be made for highly qualified students whose preparatory work has been completed in schools which do not provide opportunity to meet the regular requirements.

At last there is a hopeful sign that it may come to pass that students intending to embark on the study of medicine will have a good foundation on which to build with the result that there will be more good doctors rather than just more doctors. Studies made by the Association of American Medical Colleges over a long period of years have shown that more often than not students with the A.B. degree rank the highest and have the fewest failures, whereas students with the B.S. degree usually are at the bottom of the class, outranked by even the two year college students and, of course, the three year students. Furthermore, it has also been shown that students offering much credit in Latin, Greek and mathematics outrank all other students. That is especially true of the mathematicians. Their mental processes rather than their memorizing ability have been stimulated and developed. In the study of medicine, thinking is of much more importance than memorizing. All medical educators are agreed on that point. The studies mentioned above also show that it is not a question of how much time has been spent in college that determines the quality of performance in medical school as is how that time was spent; what courses of study were taken and have the student's mental processes been stimulated.

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Dr. H. G. Weiskotten

Dr. H. G. Weiskotten, dean Syracuse University College of Medicine, has been elected chairman of the Council on Medical Education and Hospitals of the American Medical Association. He is the third chairman of the council. The first chairman was Dr. Arthur Dean Bevan; the second, Dr. Ray Lyman Wilbur. Dr. Weiskotten has long been a member of the council. He was also for many years chairman of the former Committee on Medical Education and Pedagogics of the Association of American Medical Colleges and gave outstanding service to the Association and medical education in that capacity.

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Dr. Victor Johnson

Dr. Victor Johnson, secretary of the Council on Medical Education and Hospitals of the American Medical Association since 1943, has resigned that position to assume the directorship of the Mayo Foundation, succeeding Dr. Donald Balfour who has retired. Dr. Johnson will assume his new position April 1, 1947.

College News

University of Utah
School of Medicine

On December 22, 1946, the fourth graduating class, numbering 31 students, received M. D. degrees. Dr. Richard H. Young, dean, offered the commencement address which was titled "Utah's Investment in Medical Education."

Dr. Paul S. Nicholas, formerly with the U. S. Biological Warfare Division at Camp Detrick, Maryland, has been named assistant professor in bacteriology, vice Dr. W. E. Clapper, who recently resigned to accept a position at the University of Colorado School of Medicine.

Dr. Willard M. Allen, head of the Department of Obstetrics and Gynecology, Washington University, St. Louis, delivered two lectures to the medical students and the local physicians. His lectures, sponsored jointly by the Utah Medical Foundation and the Salt Lake County Medical Society, were titled: "Clinical Use of the Female Sex Hormone," and "Hormonal Control of Pregnancy."

Dr. Frederick A. Coller, professor and head of the Department of Surgery, University of Michigan Medical School, recently gave two lectures on "Replacement of Fluid Losses Associated with Operation and Trauma," and "Prevention of Postoperative Complications" under the sponsorship of the Intermountain Surgical Lectureship and the Salt Lake County Medical Society.

Dr. M. M. Wintrobe, head of the Department of Medicine, recently delivered lectures on leukemia before postgraduate students of the University of California Medical School.

The Department of Obstetrics and Gynecology was recently awarded the annual prize for 1946 by the Central Association of Obstetricians and Gynecologists for the best clinical investigative work. The research which was carried out is described in a paper entitled "Menorrhagia Associated with Irregular Shedding of the Endometrium." The authors were E. G. Holmstrom and C. E. McLennan.

At a recent meeting in San Francisco, a new scientific medical society was launched with the purpose of providing annual meetings and discussions for investigators in clinical medicine and its allied fields. The meetings of this "Western Society for Clinical Research" are to fill the needs for scientific interchange of the West in a manner similar to those of the "Central Society for Clinical Research" in the Middle West and of the "Society for Clinical Investigation" in the East. Two of the six counselors who were elected are members of the University of Utah Medical School: Dr. C. E. McLennan, professor and head of the Department of Obstetrics and Gynecology, and Dr. Hans H. Hecht, assistant professor, Department of Medicine. Dr. Val Jager of the Department of Medicine, reported on his study of the treatment and metabolic changes of certain types of arthritis and Dr. Hans Hecht presented the results of his and his associates' work on a new agent employed in the diagnosis and treatment of cardivascular diseases.

A supplementary grant of $27,750 has been made to the School of Medicine for further support in the study of muscular dystrophy and other hereditary and degenerative disorders. This supplements the grant of $92,000 made last year by the U. S. Public Health Service, Research Grants Division, for the same purpose.

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Washington University
School of Medicine

Washington University School of Medicine has established a program of regional scholarships, to include at least seven awards annually to incoming freshmen and transfer students. The scholarships, under the Jackson Johnson Scholarship Fund, will be awarded to candi-

dates of exceptional ability who have resided for at least three years in one of the seven regions in the United States, and who have completed their premedical training or their first two years of medical training in that region. At least one scholarship will be awarded in each region. The stipends will vary according to the financial need of the student, with a maximum of $1,200 a year. Awards may be renewed for the succeeding years of the medical course, provided the student's record justifies renewal.

Three graduate fellowships will also be awarded each year for five years under the Jackson Johnson fund. Applicants must be graduates of a recognized school of medicine, and acceptable for admission to the School of Graduate Studies of Washington University as candidates for a doctorate degree. All applications must be completed by March 1 for the period beginning the following September.

Dr. Conrad Somner, assistant professor of clinical psychiatry, has been appointed consultant in psychiatry to the advisory committee on Community Services of the Advisory Council to the Surgeon General of the U. S. Public Health Service for the National Health Act.

An award of $17,110 by the Medical Sciences Branch of the Office of Naval Research was given to Washington recently for research on edema. The research work will be under the direction of Dr. Palmer H. Futcher, assistant professor of medicine in charge of the metabolism division of the Department of Medicine.

Washington was one of 21 universities to receive a grant for cancer research, it was announced by the National Advisory Council. The work will be supervised by Dr. Sherwood Moore, head of the Department of Radiology and a member of the Advisory Council; Dr. A. L. Hughes, consulting physicist to Mallinckrodt Institute of Radiology; Dr. E. H. Reinhard, assistant professor of medicine and radiology, and Dr. Carl V. Moore, professor of medicine.

A Department of Electroencephalographic Technology will be established next fall, under the direction of Dr. James O'Leary, professor of neurology. The eight-month course will begin October 1, and extend through June 1, to be divided into three trimesters. Prerequisite for the course is graduation from an approvad high school in the upper two-thirds of the graduating class. Instruction in the course will be given by Dr. O'Leary, Dr. George Bishop, professor of biophysics, and Dr. William Fields, assistant in neuropsychiatry.

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Duke University
School of Medicine

A month's course in medical mycology, under the direction of Dr. Norman F. Conant, is to be offered during July, 1947. The course will be offered every day in the week, except Sunday, and has been designed to insure a working knowledge of the human pathogenic fungi within the time allotted. Emphasis will be placed on the practical aspects of the laboratory as an aid in helping establish a diagnosis of fungus infection. Insofar as possible and as patients become available, methods of collecting materials in the clinic for study and culture will be stressed. Work with patients, clinical material, cultures and laboratory animals will serve as a basis for this course. Also, an opportunity to study pathologic material, gross and microscopic, will be given those whose previous training would allow them to obtain the greatest benefit from a study of such material.

The number of applicants for the course will be limited and the applications will be considered in the order in which they are received. An attempt will be made, however, to select students on the basis of their previous training and their stated need for this type of work. A fee of $50.00 will be charged for this course, on the completion of which a suitable certificate will be awarded. Direct inquiries to Dr. Norman F. Conant, Duke University School of Medicine, Durham, N. C.

Dr. Hans Löwenbach, associate pro-

fessor of neuropsychiatry, has just returned from a six months' assignment in occupied Germany. During this time Dr. Löwenbach visited, under the sponsorship of F.I.A.T. (Field Intelligence Agency Technical) most of the medical schools in the American, British and French zones of occupation and in Berlin. Dr. Löwenbach's assignment was to gather such manuscripts on medical and related research that had remained unpublished due to the war and after-war conditions. More than 25,000 pages of original manuscripts in all fields of medicine were gathered and microfilmed. At the present time, this material is on its way to this country to be catalogued and abstracted. The material is available to the public through the Publications Board, Department of Commerce, 16th and K, Washington 25, D. C.

Dr. Hsiao-Chien Chang, Dean of Hsiang Ya (Yale-in-China) Medical College, Changsha, Hunan, China, and Dr. Pao-Chang Hou, Professor of Pathology at Cheeloo University, Tsinan, China, were visitors on November 10-17. As guests of the Department of State, U. S. A., these doctors will continue to visit American medical institutions until June, 1947, at which time they will return to China to resume work in their respective universities. Dr. Chang addressed the undergraduate medical society on "Medical Education in China," and Dr. Hou's lectures to the Duke faculty and student body on "Leprosy and Plague" and on "Kala-Azar" not only contributed to the general understanding of these diseases, but also to an appreciation of medical problems in his native country.

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University of Texas
School of Medicine

Texas announces a postgraduate course in physical medicine and rehabilitation from March 3 to 7. Fifteen outstanding speakers, nationally recognized authorities, will participate.

Designed for the practitioner interested in the use of physical medicine in general practice as well as in the medical specialties, the course will include instruction in the theory and technique of application of the various physical agents, and will emphasize the practical, clinical aspects of physical medicine. The use of the various physical procedures in the surgical, orthopedic and medical conditions most commonly encountered will be discussed. Symposia on arthritis and poliomyelitis are to be held. A number of demonstrations and motion pictures will be presented in addition to the didactic lectures.

Dr. J. B. Nail and alumni associates of Wichita Falls have made an initial grant of $500 to the university for the establishment of a research fund for the study of deafness. It is the intention of the alumni in the Wichita Falls area to maintain this research fund by annual grants.

J. B. Roerig and Company of Chicago have granted $2,500 to the Tissue Culture Laboratory, under the direction of Dr. C. M. Pomerat, for research on fectors involved in cellular growth and inhibition of growth.

The National Foundation for Infantile Paralysis, Inc., has made a grant of $11,675 for the support of a study to be made by Dr. Morris Pollard in the Virus Laboratory for the purpose of developing a practical serological test for the diagnosis of poliomyelitis.

The Smith, Kline and French Laboratories of Philadelphia have made a two-year grant of $6,000 for the support of pharmacological studies of new compounds under the direction of Dr. George Emerson of the Pharmacology Laboratory.

Mr. Meyer Epstein and Mr. Jerome Epstein of San Antonio have given a grant of $5,000 for the purpose of establishing the Leib Epstein Medical Student Loan Fund.

The first annual Student Day program of the university was held at the end of the first semester for the purpose of reporting outstanding student research. The speaker on the occasion was Dr. O. H. Wangensteen, professor of surgery at the University of Minnesota.

University of Colorado
School of Medicine

Appointments: Dr. Harry H. Gordon, professor of pediatrics and head of department; Harriot H. Hunter, assistant professor of psychiatry; E. Stewart Taylor, associate professor of obstetrics and gynecology; Ernst A. Scharrer, associate professor of anatomy; Henry Swan, II, assistant professor of surgery; Marion M. Maresh, assistant professor of physical growth; Cotter Hirschberg, assistant professor of psychiatry; Horace J. Dodge, assistant professor of public health and laboratory diagnosis; Harold Dinken, assistant professor of medicine and head of division of physical medicine; Jean M. Deming, assistant professor of physical growth; Jules V. Coleman, assistant professor of psychiatry; William E. Clapper, assistant professor of bacteriology; Florian A. Cajori, assistant professor of biochemistry; Edith Boyd, assistant professor of physical growth; Wray J. Tomlinson, assistant professor of pathology; William H. Roper, assistant professor of medicine; Walter W. King, assistant professor of obstetrics and gynecology; Erving F. Geever, assistant professor of pathology; Paul A. Draper, assistant professor of psychiatry; Lewis Barbato, assistant professor of psychiatry; Bernard N. E. Cohn, assistant professor of pathology.

Resignations: Fred R. Ingram, assistant professor of medicine and assistant director of the Division of Industrial Hygiene; Robert W. Davis, assistant professor of psychiatry; Charles J. Kaufman, associate professor of medicine (tuberculosis).

Deaths: Archibald J. Chisholm, assistant professor of surgery (proctology); Richard G. Smith, assistant professor of surgery (urology).

The Child Research Council long affiliated with the School of Medicine, has recently been made one of the teaching departments of the school, under the title of "Department for the Study of Human Growth." Dr. Alfred H. Washburn is head of this department, his rank being: Research Professor of Pediatrics.

Bowman Gray School of Medicine

Announcement was made on January 2, 1947, of the establishment of a $1,700,000 endowment fund by Mr. James A. Gray of Winston-Salem, the income of which will go to eleven North Carolina colleges. The principal beneficiary of the endowment fund is the Bowman Gray School of Medicine of Wake Forest College, which was awarded $900,000 of the amount. Mr. Gray is chairman of the Executive Committee of the R. J. Reynolds Tobacco Company and a brother of the late Bowman Gray.

On December 29, 1946, a gift of $60,000 was received from Mrs. Nathalie Gray Bernard. This fund is to be used in further support of the development of the Department of Neuropsychiatry. Mrs. Bernard had previously given Graylyn Estate, valued at $1,000,000, to be used for that purpose, and her son Gordon Gray had previously made a gift of $125,000 to support the development of psychiatry.

Faculty Appointments: Dr. Thomas Blair, assistant professor of periodontia and oral surgery; Dr. W. Eugene Cornatzer, assistant professor of biochemistry; Dr. MacDonald Fulton, associate professor of bacteriology and director of the department; Dr. Richard A. Groat, assistant professor of anatomy in charge of neuroanatomy and histology; Dr. Douglas M. Kelly, associate professor of neuropsychiatry; Dr. Janet Mackie, assistant professor of preventive medicine; Dr. Thomas T. Mackie, professor of preventive medicine and chairman of the division of medicine; Dr. Richard L. Masland, assistant professor of neuropsychiatry; Dr. Lloyd J. Thompson, professor of neuropsychiatry and director of department of neuropsychiatry.

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University of Louisville
School of Medicine

Eight scholarships of $2,000 each have been established for the $100,000 Medical Scholarship Fund for medical students who agree to practice in rural districts of Kentucky after graduation. The

scholarships will be administered by the trustees of the fund for the Kentucky State Medical Association and the University of Louisville School of Medicine. Dr. Omer Forest Hume, Richmond, donated the first scholarship. Dr. Hume graduated from the medical department of the University of Louisville in 1917. The Dr. Van A. Stilley Memorial Scholarship has been set up by his heirs. The Houston Memorial Scholarship has been granted by Mrs. Jesse Houston Roane, Drs. Hugh L. Houston and Hal E. Houston, Murray, in memory of their father, the late Dr. Edward Brent Houston. The scholarship is to be awarded to a premedical student of high standing from Murray State College. Dr. Carl Clifford Howard has presented the Howard Clinic Scholarship. A scholarship was granted by Dr. Gaithel L. Simpson, Greenville, member of the state board of health and board of trustees of the scholarship fund.

Three scholarships of $2,000 each honoring Dr. Charles W. Jefferson, Louisville, have been set up at the University of Louisville School of Medicine by Joseph E. Seagram and Sons Company, distillers, which Dr. Jefferson serves as physician. The Dr. Charles W. Jefferson Scholarship for Surgery was donated by H. Fred Willkie, vice president of the company, and Mrs. Willkie. The Charles W. Jefferson Industrial Medicine Scholarship was raised by employees from cafeteria funds and recreational programs. The Charles W. Jefferson Scholarship for Rural Medicine was established by the company. About one third of the total fund has been subscribed. The revolving Medical Scholarship Fund, launched Dec. 12, 1945, was set up originally as a revolving fund of $50,000 to $75,000 and the first scholarship was awarded last spring. The trustees of the fund are Drs. John W. Moore, dean, University of Louisville School of Medicine; Gaithel L. Simpson, Greenville; Carl Norfleet, Somerset; Philip E. Blackerbey, Louisville; Senator Cass Walden, Edmonton; Joe Betts, Louisville *Courier-Journal;* Russell Dyche, London, and Mrs. Charles Shelton, Louisville.

Woman's Medical College

The following grants have been made to members of the Woman's Medical College of Pennsylvania faculty: $3,500 to Dr. L. Kraeer Ferguson, professor of surgery, from Smith, Kline and French, Inc. Dr. William L. White, who has been appointed clinical associate in surgery on a full-time basis, will work on this project. $2,000 from Hoffmann-La Roche, Inc., to a group including Dr. Mary DeWitt Pettit, professor of gynecology, Dr. Dorothy Ashton, associate professor of gynecology, Dr. Stanford Mulholland, professor of urology, and Dr. Joseph T. Freeman, instructor in medicine. This grant is made in support of research work on the significance of Vitamin E preparations in the treatment of the climacteric in men and women. $500 from the Council on Pharmacy and Chemistry of the American Medical Association, to Dr. Grace E. Wertenberger, assistant professor of physiology, to aid her in further studies on cardiac physiology as revealed by the electrocardiogram during serum sickness and sulfonamide hypersensitivity reactions. $500 from Abbott Laboratories to Dr. Lloyd D. Seager, professor of pharmacology and toxicology, for research on chemotherapy of trypanosomiasis.

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University of Wisconsin Medical School

Dr. Erwin H. Ackerknecht has been appointed professor of the history of medicine. Dr. Ackerknecht comes to the medical school from the staff of the American Museum of Natural History in New York City, and was formerly associated with the Institute of the History of Medicine at Johns Hopkins University in Baltimore. He was born in Stettin, Germany, in 1906, and studied for a period of nine years at the "Humanistisches Gymnasium" in Stettin. Later he studied medicine and sociology in Freiberg, Kiel, Berlin, Vienna and Leipzig. In 1930 he was an intern at the University Polyclinic for Internal Diseases in Leipzig and was granted a German medical license that same year. In

1931, he received the degree of Doctor of Medicine from the University of Leipzig. Later he served as an assistant in the Hospital for Mental Diseases in Berlin. Dr. Ackerknecht studied at the Sorbonne, Paris, and was made an assistant in the "Institut des Maladies Professionnelles" in Paris. He came to this country in 1941 and became a research fellow at the Institute of the History of Medicine, Johns Hopkins University. Later he joined the staff of the Department of Anthropology of the American Museum of Natural History in New York City.

A new loan fund had been established for medical students by Dr. A. J. Carlson, emeritus professor of medical physiology at the University of Chicago. Dr. Carlson has requested that this be named the Walter Joseph Meek Loan Fund for superior but financially needy students in the medical sciences. As the creator and original donor to the fund, Dr. Carlson contributed $400, and it is expected that this fund will continue to grow with the donations of former students as well as the colleagues of Dr. Meek.

An intensive course in pediatrics for the general practitioner will be offered April 7-11, under the supervision of Dr. J. E. Gonoe, Jr., professor of pediatrics, Dr. H. K. Tenney and Dr. K. B. McDonough of the pediatric division. Fee, $25.

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Temple University
School of Medicine

Dr. J. Robert Willson has been appointed professor and head of the department of obstetrics and gynecology. Dr. Willson is a graduate of the University of Michigan Medical School, where he also obtained a M.S. in obstetrics and gynecology. He will devote his entire time to teaching.

Dr. Valy Menkin has been appointed associate professor of experimental pathology. He received the B.S. and M.A. from Columbia and the M.D. degree from Harvard in 1922. He has done research in experimental pathology at Harvard and Duke.

The National Cancer Institute of Bethesda, Maryland, has made a grant of $10,000 for the study of the relation of cellular injury to the development of repair and Neoplastic Tendencies. The U. S. Public Health Service has made a grant of $20,750 a year for the physical and physiological investigation of the heart and circulation. The study has shown that by means of the electrokymograph accurate tracings of the motion of the borders of the chambers of the heart and of the great vessels can be obtained.

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Western Reserve University
School of Medicine

Under grants totalling $112,000, from the National Foundation for Infantile Paralysis, research workers at Western Reserve University will apply some of the latest methods of biochemistry to find out how the polio virus attacks the nerves and brains of its victims. Their study will cover a period of five years. Members of the staff of the biochemistry department will make the study: Dr. Harland G. Wood, head of the department; Dr. Morton F. Utter, associate professor of biochemistry; Dr. John A. Muntz and Dr. Thomas P. Singer, assistant professors, and Dr. G. Robert Greenberg, instructor.

A $70,000 grant from the Cleveland Foundation has been made to aid in the operation of the Elisabeth Severance Prentiss department of preventive medicine. Of the total, $25,000 is to be paid immediately and the remainder in the amount of $15,000 a year for the next three years. The department of preventive medicine was created in 1945 by a gift of $606,000 from the estate of the late Mrs. Elisabeth Severance Prentiss.

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University of Cincinnati
College of Medicine

Dr. Maurice Levine has been appointed professor and head of the department of psychiatry and director of the psychiatry service in the Cincinnati General Hospital.

Yale University
School of Medicine

The extensive medical library of the well known historian of medicine and science, the late Dr. Arnold C. Klebs, of Nyon, Switzerland, has been delivered to the Yale Medical Library. Before his death in March of 1943, Dr. Klebs, although not a Yale man, was persuaded by the late Dr. Harvey Cushing, Yale 1891, to deed his collections to Yale University. His library, consisting of more than 22,000 titles, was carefully packed under the supervision of Dr. A. C. Breycha-Vauthier, Deputy Librarian for the United Nations Library, and stored for the duration of the war at Geneva, Switzerland.

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Syracuse University
College of Medicine

Dr. Richard H. Lyons, associate professor of medicine in the University of Michigan Medical School, has been appointed professor and head of the department of medicine. He will take up his duties June 1.

A new clinical research laboratory, to be utilized by physicians connected with the College of Medicine, will be set up in the University Hospital.

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University of Buffalo
School of Medicine

Dr. John R. Paine, professor of surgery in the University of Minnesota Medical School, has been appointed professor and head of the department of surgery at the Buffalo General Hospital on a full time basis. Dr. John Talbott is full time professor and head of the department of medicine in the same hospital.

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University of California
Medical School at Los Angeles

Dr. Stafford L. Warren, professor of radiology in the University of Rochester School of Medicine, has been appointed dean and professor of biophysics in this new medical school. He is a graduate of California, 1922.

Ohio State University
College of Medicine

Dr. Robert H. Zollinger, formerly a member of the Harvard Medical School faculty and at present director of the dental office, section of surgery of the professional services division of the Veterans Administration, has been appointed chairman of the department of clinical surgery, succeeding Dr. Verne A. Dodd who resigned the administrative post to devote full time to his other responsibilities as professor of clinical surgery and chief of staff of the University Hospital.

A postgraduate course for physicians will be given March 17-22. The course will cover the most frequently encountered diagnostic and therapeutic problems. Attendance limited. Fee, $20.

Dr. Harold C. Haynie has been appointed assistant medical director of the Ohio State University Hospital and its outpatient department and as assistant professor of medicine and hospital administration in the medical school.

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Cornell University
Medical School

A five year research into the causes of chronic alcoholism will be financed by funds from the Research Council on Problems of Alcohol and several distilling companies, together with sources of the school and hospital funds. The research is to be carried on under the direction of Dr. Oscar Diethelm, professor of psychiatry and psychiatrist in chief at the hospital. The project is in effect a continuation of work that a research team at the hospital has been carrying on for the past five years.

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Southwestern Medical College

Dr. George T. Caldwell, professor and chairman of the department of pathology, died recently. He joined the faculty of Southwestern in 1943 after having held the same position in Baylor University School of Medicine for 24 years.

University of California
Medical School

The first Francis I. Proctor Lecture in Ophthalmology was delivered in December by Dr. Kenneth Swan, University of Oregon Medical School, 1946, on "Some Contemporary Concepts of Pharmacology and Toxicology of the Cornea." The yearly lecture was recently established at the school by a $20,000 gift from Mrs. Francis I. Proctor in memory of her husband.

Dr. Otto E. Guttentag from the University of California Medical School has been granted a temporary leave of absence, and has been appointed Consultant in Medical Education in Germany with the Office of the Military Government in Germany.

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University of Nebraska
College of Medicine

The Charles F. Morsman Foundation has been established by Dr. Chas. F. Morsman of Hot Springs, S. D., a graduate of the college, "to enhance and disseminate knowledge in endocrinology, to train men and women to become endocrinologists, and to provide diagnosis and treatment of persons who are ill or abnormal because of disorders of endocrine glands."

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New York University
College of Medicine

Dr. Fred Karush of Elmhurst, New York, has been awarded a three year fellowship by the American Society for Cancer Research. He will work under the direction of Dr. R. Keith Cannan, of the department of chemistry.

New York University College of Medicine, in cooperation with WNBC, New York, has inaugurated a series of weekly programs entitled "How's Your Health?" featuring members of the faculty as guest speakers and Dean Currier McEwen as "medical moderator." The program, heard every Saturday afternoon from 2 to 2:15, will originate from Dean McEwen's office at the College of Medicine and will run thirteen weeks.

Harvard Medical School

Dr. Seymour J. Gray, formerly assistant professor of medicine at the University of Chicago, has been appointed assistant professor of medicine at Harvard Medical School and senior associate of medicine at the Peter Bent Brigham Hospital in Boston. Dr. Gray will divide his time between his duties as director of the gastrointestinal clinic at the hospital and as a member of the medical school group concerned with research in the biophysical laboratory.

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University of Washington
School of Medicine

The board of trustees of King County Hospital and the board of regents of the University of Washington have agreed to an affiliation between the school of medicine of the university and the King County hospital system. The staff of the hospital has been reorganized so that the early clinical teaching program of the medical school may be developed along both the undergraduate and the graduate program.

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University of North Carolina
School of Medicine

The Cinchona Products Institute has given the school a grant for the continuation of the work of Dr. Edwin P. Hiatt on the effects of quinine and other cinchona alkaloids on renal function and blood pressure.

New Appointments: Drs. Kenneth M. Brinkhous, John B. Graham, Wm. S. Randall, Arthur V. Jensen, Fred L. Rights, Frederick A. Blount

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Tulane University of Louisiana
School of Medicine

The departments of tropical medicine and preventive medicine have combined to form a new department of tropical medicine and public health. The enlarged department will consist of three units: clinical tropical medicine, parasitology and public health. Plans are under way to offer a course which will

lead to a combined degree in tropical medicine and public health. Plans are also being made for the new department to take over the University Student Health Service, with greatly enlarged facilities. This will involve the establishment of a university infirmary for all nonresident students. The new health service will act as a training center for public health instruction. The new department will be headed by Dr. William A. Sodeman, who has been head of the Department of Preventive Medicine since 1941. Dr. Sodeman is now carrying on special clinical studies at the School of Tropical Medicine in Puerto Rico and will later visit Venezuela and Panama, where he will study prevalent tropical diseases and methods for their control. The merger of the two departments will become effective when he returns.

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Stanford University
School of Medicine

William Walter Greulich, professor of anatomy and director of the Brush Foundation, has returned to the United States after spending three months in Australia and New Zealand. In addition to visiting the Australian and New Zealand universities and medical schools, he lectured under the auspices of the various postgraduate medical committees to chapters of the British Medical Association in all the principal cities of those two countries.

The sixty-fifth course of popular medical lectures will be given March 7, 21; April 11, 25. Subjects discussed will be: "New Eyes for Old; Corneal Transplants;" "Delinquency and Mental Health in a Changing World;" "The War on Cancer;" "Contagion from Foreign Lands."

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Emory University
School of Medicine

A new surgical pavilion in the Whitehead Memorial Room in Emory University Hospital, Atlanta, was dedicated recently. The pavilion was established by Mrs. Letitia P. Evans, Hot Springs, Va., mother of the late Conkey P. Whitehead, Atlanta. The dedicatory address was given by Dr. Alfred Blalock, professor of surgery, Johns Hopkins University School of Medicine, Baltimore.

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University of South Dakota
School of Medicine

Dr. R. Perry Elrod of the Rockefeller Institute has been appointed professor of microbiology.

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Georgetown University
School of Medicine

Dr. Charles F. Geschickter has been appointed professor of pathology and parasitology and director of the department.

Dr. Willy Baensch, recently of Leipzig, Germany, has been appointed professor of roentgenology. Dr. Robert F. Dow has been appointed associate professor of medicine and head of the Department of Physical Therapy. Dr. Murray M. Copeland, appointed professor of oncology and head of the Department of Radiology. Dr. Norman Q. Brill, appointed professor and director of the Department of Neurology. Dr. Samuel Hicks, associate professor of pathology.

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Medical College of Alabama

Dr. James O. Foley, associate professor of anatomy, has been appointed professor and chairman of the department of anatomy, succeeding Dr. C. M. Goss, who now occupies a similar position in the School of Medicine of the Louisiana State University.

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Wayne University
College of Medicine

Dr. M. Evans Maxfield, at present assistant professor of physiology at Mt. Holyoke College, has been appointed to the staff of the Department of Pharmacology and Therapeutics.

Book News

The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics

By Wilburt C. Davison, M.D., Professor of Pediatrics, Duke University School of Medicine, and Pediatrician, Duke Hospital. Ed. 5. Duke University Press, Durham, N. C. 1946. Price, $4.

The author has condensed into comparatively small space all available information on diseases of children and in a form which makes it readily usable. The fact that the book has gone into five editions testifies to its appreciation by students and practitioners. Teachers of pediatrics doubtless have found the book valuable. All known facts are presented without any wastage of words. The author must be complimented on his fine achievement.

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Pharmacology and Therapeutics

Originally written by Arthur R. Cushny, M.D., Late Professor of Materia Medica and Pharmacology in the University of Edinburgh. Ed. 13, thoroughly revised by Arthur Grollman, M.D., Professor of Medicine and Chairman of the Department of Experimental Medicine and Professor and Chairman of the Department of Physiology and Pharamcology in the Southwestern Medical College, and Donald Slaughter, M.D., Dean of the School of Medicine of the University of South Dakota, formerly Professor and Head of the Department of Physiology and Pharmacology in Southwestern Medical College. Lea & Febiger, Philadelphia. 1946. Price, $8.50.

Cushny brought up to date by deletions and additions; new methods; new drugs—all of which enhance the value of a book which has always been a standard in pharmacology both practical and theoretical.

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An Integrated Practice of Medicine

By Harold T. Hyman, M.D. In four volumes plus index; 1184 illustrations; 305 in color; 319 differential diagnostic tables. W. B. Saunders Company, Philadelphia. 1947. Price, $50 per set.

"Cannot be compared with any other existing work because nothing like it has ever been published." "A complete general practice of medicine from differential diagnosis by presenting symptoms to specific management of the patient." Cardinal objectives include: (1) complete delineation of the broad and diverse fields of general practice; (2) arrangement of material in the chronological sequence of everyday practice; and (3) integration of the various subjects so that each discussion focuses consideration on the human patient as a biologic unity. It brings together all the factors that go to make up the general practice of medicine in a readable and informative way. The author's preface, which is a long one, explains the aims of this work. It is different from other published works and will, no doubt, attract considerable attention. Of course, it is too large for the medical student but the practitioner will find it a valuable addition to his "must" reading. Incidentally, the publishers must be complimented for their part of the work.

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The Anatomy of the Nervous System

By Stephen Walter Ranson, M.D. Late Professor of Neurology and Director of the Neurological Institute, Northwestern University Medical School. Revised by Sam Lillard Clark, M.D., Professor of Anatomy, Vanderbilt University School of Medicine. Ed. 8. W. B. Saunders Company, Philadelphia. 1947. Price, $6.50.

Changes have been introduced in three ways: The order of presentation has been altered to some extent; new textual material and illustrations have been added and various parts have been rewritten. The greatest change in sequence of material has been the collection of gross descriptive anatomy into one chapter and it appears early in the text and it emphasizes the significance of the nervous system to the interpretation of normal and abnormal physiology generally. Furthermore, the work has been brought up to date with recent advances in this field.

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Gynecological and Obstetrical Pathology: With Clinical and Endocrine Relations

By Emil Novak, M.D., Associate in Gynecology, Johns Hopkins Medical School. Ed. 2. W. B. Saunders Company, Philadelphia. 1947. Price $7.50.

The "profusion" of illustrations—there are more than five hundred—is not the least of the valuable features of this book. The student who has occasion to use this book will find it helpful in securing an understanding of the pathology of the diseases discussed. It is by no means an exhaustive book, but it does give all the essentials in a clear, concise, easily understood manner.

The Story of Human Birth

By Alan F. Guttmacher, M.D., Associate Professor of Obstetrics, Johns Hopkins University School of Medicine. Penguin Books, Inc., New York. 1947. Price, $0.25.

The author discusses clearly and simply every phase of birthing, from the time the mother first suspects that she is pregnant until a few weeks after the delivery of the babe. The laity will benefit from its reading because it is written in language which the layman can understand. The medical student will also find the book interesting—and easy to understand which is not always the case when he must place dependence on a large encyclopedic presentation of the subject. And the book costs only 25c!

◆ ◆

Practical Chemistry for Medical Students

By William Klyne, B.S. Lecturer in Biochemistry, University of Edinburgh. With a foreword by G. F. Marrian, F.R.S. Professor of Chemistry in Relation to Medicine, University of Edinburgh. The Williams & Wilkins Company, Baltimore. 1946. Price, $6.

Based on practical courses given to premedical and first year medical students "representing the minimum of instruction in practical chemistry which the medical student should receive."

◆ ◆

Essentials of Obstetrics and Gynecology

By William A. Scott, M.B. and H. Brookfield Vanwyck, M.B., respectively Professor and Assistant Professor of Obstetrics and Gynecology, University of Toronto. Lea & Febiger, Philadelphia. 1946. Price, $5.50.

Condensed but covers all essentials. A good book for the student.

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Allergy in Theory and Practice

By Robert A. Cooke, M.D., Director of the Department of Allergy, Roosevelt Hospital; assisted by a group of allergists. W. B. Saunders Company, Philadelphia. 1947. Price, $8.

The value of this book in the teaching of allergy to medical students is stressed. It covers the field of allergy well and should, therefore, serve well as a text for students.

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A Laboratory Manual of General Biology

By E. Grace White, Ph.D., Professor of Biology, Wilson College. Ed. 3. The C. V. Mosby Company, St. Louis. 1947. Price, $2.

An excellent aid to the study of biology. Premedical students, please note—and use.

The Chemical Kinetics of the Bacterial Cell

By C. N. Hinshelwood, F.R.S., Professor of Chemistry, University of Oxford. The Clarendon Press, Oxford, England. 1947. Price, $6.75.

An approach by a physical chemist to certain aspects of bacteriology. Chemical reactions have long been studied in isolation. The further problem of how they are coordinated for the purpose of the cell is here discussed in relation to the phenomenon of the growth and adaptation of bacteria. Prominance is given to the physicochemical interpretation of the extraordinary power possessed by the cells to train themselves to resist drug reaction.

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Progress in Gynecology

Edited by Joe V. Meigs, M.D., Clinical Professor of Gynecology, Harvard Medical School, and Somers H. Sturgis, M.D., Chief, the Vincent Memorial Hospital Laboratory. Grune & Stratton, New York. 1947. Price, $7.50.

Seventy men, each one an expert in his field, have contributed to this volume, which gives the reader an opportunity to catch up with what he undoubtedly missed by way of advancement in his own particular field while in service.

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The Parasites of Man in Temperate Climates

By Thomas W. M. Cameron, Professor of Parasitology, McGill University and Director Institute of Parasitology, Macdonald College, Quebec. Ed. 2. The University of Toronto Press, Toronto, Canada. 1946. Price, $3.25.

In addition to the worth while material presented in this work in the previous edition, the present one includes an appendix dealing with parasites and parasitic diseases of exotic origin, likely to be seen in north temperate climates as a result of the war. New illustrations and diagrams have been added.

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Demonstrations of Physical Signs in Clinical Surgery

By Hamilton Bailey, F.R.C.S. (Eng.), Surgeon Royal Northern Hospital, London. Ed. 10. The Williams & Wilkins Company, Baltimore. 1946. Price, $7.

Everything about this book is commendable: its small size, conciseness, arrangement and the many hundreds of illustrations, some in color. It is a real student textbook.

Modern Dermatology and Syphilology

By S. William Becker, M.D., Clinical Professor of Dermatology, University of Chicago, and Maxmillian E. Obermayer, M.D., Clinical Professor and Chairman of the Department of Dermatology, University of Southern California. Ed. 2. J. B. Lippincott Company, Philadelphia. 1947. Price, $13.

Revised and brought up to date. The use of dioxan is described. The chapter on dermatologic therapy has been enlarged. Modern vehicles developed for the preparation of remedies for local use are discussed. Vitamins, penicillin, the sulfonamides, pigmentary dermatoses, trophic and deficiency diseases and a new chapter on lepra are noteworthy additions. It is unfortunate that in order to present the subject fully, 1,000 pages were needed, which, with the special paper required for the many fine illustrations makes the book too heavy to hold in a reading position. It calls for desk space. But all of this is worth while considering the excellence of the book.

◆ ◆

Practical Physiological Chemistry

By Philip B. Hawk, Ph.D., President Food Research Laboratories, Inc., Long Island City, and Bernard L. Oser, Ph.D., Director of Food Research Laboratories, and William H. Summerson, Ph.D., Associate Professor of Biochemistry, Cornell University Medical College. Ed. 12. The Blakiston Company, Philadelphia. 1947. Price, $10.

A complete discussion of the subject, admirably done and up to date. Our only criticism of the book is that it is too large for student use. It contains far more material than he has time to read and digest. For him who intends to specialize in this field, it is a splendid book and if the student had time to read and absorb it all, it would be equally good for him.

◆ ◆

Medicine in the Changing Order

Report of the New York Academy of Medicine Committee on Medicine and the Changing Order. The Commonwealth Fund, New York. 1947. Price, $2.

The forty-eight committee members—laymen and experts from the fields of medicine, dentistry and nursing—have examined critically every phase of the current medical situation including medical education, nursing service, dental care, public health service, hospital facilities and medical research. This report draws together the findings of the committee's study and its thoughtful conclusions as to what may best be done to remedy the present inadequacies.

CUSHNY'S

PHARMACOLOGY AND THERAPEUTICS

Thoroughly Revised By

ARTHUR GROLLMAN, M.D., F.A.C.P.
Professor of Medicine & Pharmacology,
Southwestern Medical College

and

DONALD SLAUGHTER, M.D.
Dean of the Medical School,
University of South Dakota

Thirteenth edition, published 1947. Octavo, 868 pages, with 74 illustrations.
Cloth, $8.50

The present editors have succeeded in maintaining not merely the severely critical spirit and the rigorously scientific basis of the original work but much of the text as well. This new edition has incorporated a discussion of the important drugs which have been introduced into medicine during the past five years. They include the newer sulfonamide derivatives, penicillin, streptomycin and other antibiotics and folic acid. These and other drugs are making their first appearance in a textbook of pharamcology in the thirteenth edition of this work. They add greatly to its interest and value.

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